



DIDAC BDH

TRAINING EQUIPMENT

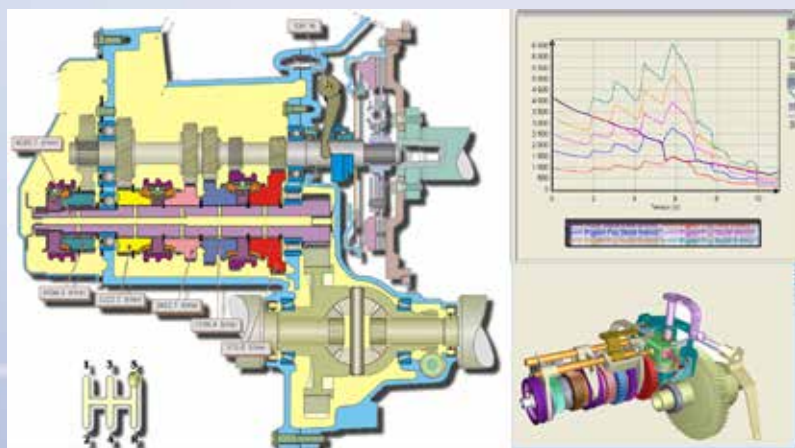
THE IDEAL LINK BETWEEN THE REAL SYSTEM AND THE DIGITAL MODEL

PRODUCT CATALOG 2027

Automotive
and Motorcycles

Commercial vehicles
and Agricultural
Machinery

Construction
and Material Handling
Equipment



DIDAC BDH SARL - ZAC Croix Chartier
42 140 SAINT DENIS SUR COISE - FRANCE
Tel : +33 4 77 02 15 70

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SYS-MSB.D
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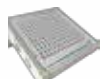


RTVT 124-CHANNEL FAULT SIMULATION AND MEASUREMENT BREAKOUT BOX

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4-CHANNEL
STANDARD KIT

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DIDAC BDH: A COMPLETE RANGE...

AUXILIARY ENERGIES

These modules are designed to develop the knowledge and methods required for a functional and structural approach to the various systems that use pneumatic and hydraulic power.



SENSORS, PRE-ACTUATORS, ACTUATORS

A set of consoles to study the data acquisition, processing, control, and user interface functions of embedded electronic systems.



ANALYSIS

These products are designed to provide input for the functional and structural analysis.

They can also be used for vehicle technology and practical exercises application.



SYSTEMS

These assemblies are used to study a vehicle functions (engine, brakes, transmission, chassis and suspension, etc.)



REAL-LIFE EXERCISES

The trainees immediately identify all the components and locate their position on the vehicle.



OPERATION

The trainees view all the operating phases, both at a standstill and when in motion, which is not possible with a vehicle that is parked in the workshop.

Measurements: conventional (multimeter and/or oscilloscope), data acquisition, using a multi-brand or manufacturer-specific diagnostic tool..



TROUBLESHOOTING

Instructors can use the built-in fault simulation boxes to easily simulate significant malfunctions that the trainees can use for diagnostic exercises.

Trainees perform the diagnostic operations using the authentic vehicle systems.



TRAINING RESOURCES

A set of documents (resources, user and instructor files) is supplied with each model.

Training materials are ideally supplemented by software, for some models.





Ref.: MPH

PRESENTATION

A series of modules (small consoles) to meet the requirements of the standards regarding training programs for auxiliary power systems. These modules are designed “to develop the knowledge and methods required for a functional and structural approach to the various systems that use pneumatic and hydraulic energies” (according to the BEP MVM reference system (French National Education)).

Methodology:

These modules provide a comprehensive and hands-on approach; indeed, each module replicates a system or subsystem equipped with actual, functioning components that perform the function being studied (production, storage, use, etc.). This allows students to interact with the system, “see” it in operation, take measurements, and more... Each module is based on an actual, existing system that we believe is most relevant for studying the selected function. Thus, each module meets the requirements of at least «Phase 1» of the curriculum guidelines: Phase 1: on a vehicle or on a teaching system.

Suggested approach for the learner	Module structure for implementing the suggested approach
1. Identify the service function	The module is really operative and can be used to identify the function, by observation.
2. Identify the main functions	Each module can be used to easily perform a functional breakdown, in particular by using the separate components.
3. Identify the functional chain(s)	The connections between the parts and their layout facilitate the functional understanding of the studied system or subsystem.
4. Show automation features	See the “Sensors, pre-actuators and actuators” collection.
5. Measure and/or view the input and output values used to validate simple functions	The instrumentation associated with each module can be used to measure the relevant functional parameters.

PNEUMATIC AND HYDRAULIC MODULES

The table below shows the modules associated with S2.2 PRODUCTION AND USE OF **HYDRAULIC ENERGY** and S2.3 PRODUCTION AND USE OF **PNEUMATIC ENERGY**.

Each module is associated with PC training software that gives details of all the operational phases, with a detailed analysis of each component.

MODULES DETAILS

<u>MODULE FUNCTION</u>	<u>COMPONENTS</u>	<u>PRODUCT IMAGE</u>
GENERATING HYDRAULIC POWER Ref.: MPH-PEH The basic components of all circuits Fuel circuit Lubrication circuit (passenger cars, industrial vehicles, agricultural vehicles, public works vehicles) Portable console	Functional assembly, including: - positive displacement pumps - adjustable pressure limiters - pressure flow rate measurement devices	
USING HYDRAULIC POWER 1 Ref.: MPH-UEH1 Hydropneumatic rear suspension (passenger vehicles) Dump truck (industrial vehicles) Arm of a pallet transporter (Manitou) (agricultural or public works vehicles) Portable console	Functional assembly, including: - a hydraulic generator - a simple effect actuator with flow limiter - a 2/2 solenoid - a manual control up/down the dumpster - a pressure measurement device	
USING HYDRAULIC POWER 2 Ref.: MPH-UEH2 Tipper truck cab (industrial vehicles) Skip tipper truck (industrial vehicles, public works) Fork base lifter (agricultural vehicles) Portable console	Functional assembly, including: - a hydraulic generator - a double effect actuator with flow limiters - a 4/3 distributor - a manual tipper control - a pressure measurement device	

GENERATING AND STORING PNEUMATIC POWER Ref.: MPH-PSEP The basic components of all circuits Workshop air circuit Portable console	Functional assembly, including: - a compressor - a tank - a safety valve - a pressure switch - pressure flow rate measurement devices	
CONDITIONING PNEUMATIC POWER Ref.: MPH-CEP The basic components of all circuits Workshop air circuit Portable console	Functional assembly, including: - a filter - a regulator - a settler - a lubricator	
USING PNEUMATIC POWER (ON/OFF Control – Solenoid Valve) Ref.: MPH-UEP.TOR1 Suspension (passenger and industrial vehicles) Engine EGR (public works and agricultural vehicles) Portable console	Functional assembly, including: - a simple effect actuator - 2/2 and 3/2 solenoids - a manual raise-lower control - a pressure measurement device	
USING PNEUMATIC POWER (ON/OFF Control – Valve) Ref.: MPH-UEP.TOR2 Bus door (industrial vehicles) Portable console	Functional assembly, including: - a double effect actuator - one 5/2 distributor and three 3/2 distributors with manual controls - adjustable flow rate limiters - a pressure measurement device	
USING PNEUMATIC POWER PROP (Pressure modulation according to the control force) Ref.: MPH-UEP.PROP HGV brakes (industrial vehicles, agricultural and public works vehicles) Portable console	Functional assembly, including: - a simple effect actuator (industrial vehicle type brake chamber) - a pressure regulator (industrial vehicle type brake control valve) - a quick-fit valve - a pressure and control effort measurement device	

PNEUMATIC AND HYDRAULIC MODULES

Trainees use training systems made up of real components in their usual operating environment. These simulators are intended for all BEP MVM courses (French National Education). A complete teaching kit is provided (on USB drive).

CHARACTERISTICS

Power:

Electric: 12 V 25 A
Pneumatic: 5 bar

Dimensions:

L = 500 D = 350 H = 320 mm

Weight:

15 kg

OPTIONS

- Storage cabinet
- 12V - 25A Fixed Power Supply with Full Protection



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training

☒ EQF 4
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tional diploma

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diploma

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AUTOMOTIVE

TRUCKS

AGRICULTURAL
MACHINERY

CONSTRUCTION

MATERIAL HANDLING
EQUIPEMENT





Ref.: ACC-VEB.24V
ACC-VEB.12V

**Available in
12 V or 24 V**

The electric's notions became inescapable in the automotive maintenance sector. A good understanding of these physical phenomena is fundamental to identify the functioning of a system and realize a relevant diagnosis. DIDAC BDH realized a suitcase "all inclusive" which allows to analyze basic electricITY assemblies from components most usually used.

This kit allows to develop skills in basic electricity from practical works, to lead activities of diagnostic system in understanding on the electric and electronic vehicles systems.

The developed skills are:

- **Identify an electric basic component: monostable switch (button type), switch bistable, swig (voltage, power), resistor, diode, light-emitting diode (LED), simple relay, relay with freewheeling diode, fusible DC motor.**
- **Cable basic electric components, verify the efficiency**
- **Measure the voltage, currents and resistor (sometimes, it is necessary to calculate them)**
- **Analyze: an assembly (plan the potential) and the measured values.**

***A COMPACT CASE FOR A PLAYFUL
AND HANDS-ON APPROACH.***

BASIC ELECTRICITY TRAINING KIT

PRESENTATION

A suitcase (with reinforced edge and lock) containing:

- A 220V connector, provided with a protection switch and with a fuse, associated with a connecting cable sector 220V.
- A stabilized and completely protected supply 24V 3A.
- 16 laboratory cables including 2 red and 2 black of 0.50 m length and 5 red, 3 black et 4 blue of 0.25 m length.



1 tray fixed on the bottom by the case, manufactured and drilled receiving :

- 1 Power supply with sockets (3 red and 3 black)
- 2 Fuses of 3A with fuse holder and hood
- 1 Differential blocking switch RT
- 1 Glass lift switch RT
- 1 PTO (power take off) switch
- 2 Classic micro relays
- 1 Mini relay with freewheeling diode
- 1 Direct-current motor
- 1 Mini relay
- 2 Resistors (500 et 1K)
- 4 Bulbs (5W et 10W)
- 1 Diode (type 1N 4007)
- 1 LED (with its resistor)



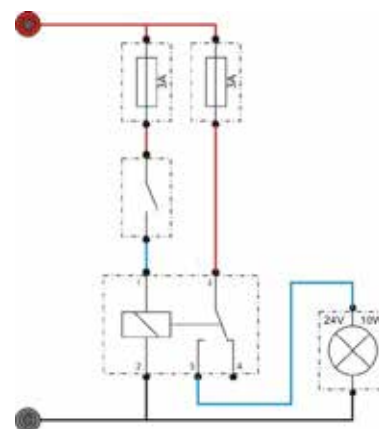
NB: The tray is opaque.

- The sockets implanted around each constituent and cabled on these components
- 1 «silk-screened» panel implanted inside the lid representing the principal plans of components (symbol and number of ways).
- 1 compartment (in the lid) for tidy up cables.
- **1 multimeter.**
- **1 workbook of practical exercises provided on a USB drive.**



TRAINING ACTIVITIES

- The series / parallel Resistor (consumer, current using, ohm's law)
- The serial / parallel lights (power, voltage, drain current)
- Simple relay (technical characteristic circuits, command / power current)
- Multiple cablings of a relay
- Diode (role and control)
- Light-emitting diode (role, power supply)
- Relay with diode of free wheel (role and control)
- Engine with live direct current and with relay (difference of potential)



CHARACTERISTICS

Dimensions:

L = 470 D = 350 H = 150 mm

Weight:

6 kg

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**TEMPERATURE
MEASUREMENT**



**PRESSURE
MEASUREMENT**



**LEVEL
MEASUREMENT**



**POSITION
MEASUREMENT**



**ROTATION SPEED
MEASUREMENT**



Ref.: CPA.G2

**RELAY
ACTUATION**



**SOLENOID VALVE
ACTUATION**



**MOTOR
ACTUATION**



PRESENTATION

These simulators are constituted of stands (same dimensions) to put on desks.

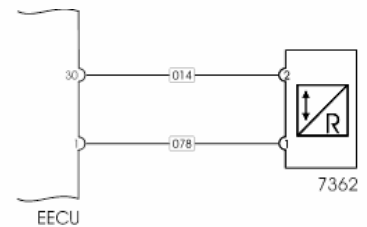
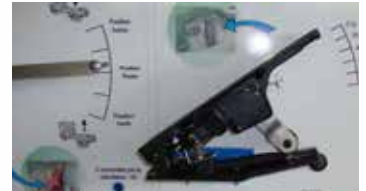
This configuration allows students to realise specific activities:

- measure data (pressure, temperature, level, position, rotation speed...).
- electromagnetic gates control (ON/OFF, Pulse Width Modulation (PWM) control, and Pull-in/Hold with charge condensing).
- engines control (DC current and step by step).

And also it allows to propose a large panel of operations.

THESE STANDS ARE COMPOSED OF

- real electronic parts for observation and experimentation.
- manufacturer drawings of electric circuits and photographs to locate them easily, in order to reproduce the environment of the sensors or the actuators.
- female plugs are fixed at connection points to ease the measures of the physical data.
- possibility of digital display panels, pressure reducers, pressure gauges according to simulations.
- the simulators are delivered with a handle for an easier transport. The dimensions and weight. It is possible to use these models in a classroom, a workshop or a laboratory. They can also be arranged in a cupboard.
- the power supply (24 V) is allowed by 2 female plugs fixed on the right side panel. For the pneumatic supply a quick connection is fixed on the left side.



PRESSURE MEASUREMENT

Non-pressurized tank sensor (drop alert).

Fowa pressure sensor (raise alert).

Air supply pressure sensor.

Oil pressure sensor (piezoelectric).

Ref.: CPA-MPR.G2



LEVEL MEASUREMENT

Oil level indicator with temp sensor.

Water level sensor with electrodes.

"Reed" fuel level indicator.

Ref.: CPA-MN.G2



POSITION MEASUREMENT

Chassis height sensor (Hall effect), accelerator pedal position sensor (Hall effect)

Ref.: CPA-MPO.G2



TEMPERATURE MEASUREMENT

Outdoor air and water temperature sensors (NTC thermistors),

Exhaust gas temperature sensor (PTC thermistor).

Ref.: CPA-MT.G2



ROTATION SPEED MEASUREMENT

ABS/EBS wheel speed sensor (inductive with associated target),

Vehicle speed sensor (Hall effect),

ABS wheel speed sensor (magnetoresistive).

Ref.: CPA-MVR.G2



PREACTUATORS AND ACTUATORS

SOLENOID VALVE ACTUATION

Exhaust brake solenoid valve (ON/OFF and Pulse Width Modulation (PWM) control), injector solenoid valve (Pull-in/Hold control with capacitor charging).

Ref.: CPA-CE.G2



RELAY ACTUATION

'Standard' relays, double relays and time-delay relays.

Ref.: CPA-CR.G2



MOTOR ACTUATION

Variable-speed, bidirectional and stepper DC motors.

Ref.: CPA-CME.G2



THE TARGETED SKILLS ARE

- Identify the different components as well as different electric and pneumatic connections (supply pressure, delivered pressure and exhaust pressure)
- Locate different components (according to photos).
- Know main technological functions.
- Measure and/or visualize the inlets and outlets to valid the system working.
- Analyse different adjustments.
- Reproduce data found by the electronic calculators (temperature, engine rotation speed ...)
- Acquire complementary knowledge and methods for a functional and structural analyze for the different electronic systems.
- Assimilate essential knowledge and know-how to carry out a diagnosis or a maintenance action.

These simulators comply with the requirements of French National Education.

A complete technical and pedagogic documentation set is supplied on USB drive.

CHARACTERISTICS

Power:
Electric 24V 12A
Pneumatic 6 to 8 Bar

Dimensions:
L = 600 D = 250 H = 450 mm

Masse:
20 kg

OPTIONS

- Protective cover
- Storage cabinet
- Fully protected 24V - 12A fixed power supply
- Picoscope 4425A - Automotive Series



Terms of sales: The simulators can be sold separately or in the complete set.

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☒ EQF 4
Secondary voca-
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☒ EQF 5
Higher technical
diploma

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Higher education

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MOTORCYCLE

CONSTRUCTION

MATERIAL HANDLING
EQUIPEMENT



PERMANENT MAGNET SYNCHRONOUS MOTOR



Ref.: CPA-MSAP



This model enables you to carry out a basic study of the operation of:

- a permanent-magnet synchronous motor (PMSM) (the most commonly used motor in EVs and hybrid vehicles),
- the motor control system (inverter).

PRESENTATION

The stand consists of four parts:

- the three-phase motor: permanent magnet rotor + the three phases
- a 'static inverter with switches'
- a 'dynamic inverter with microswitches'
- an electronic inverter.

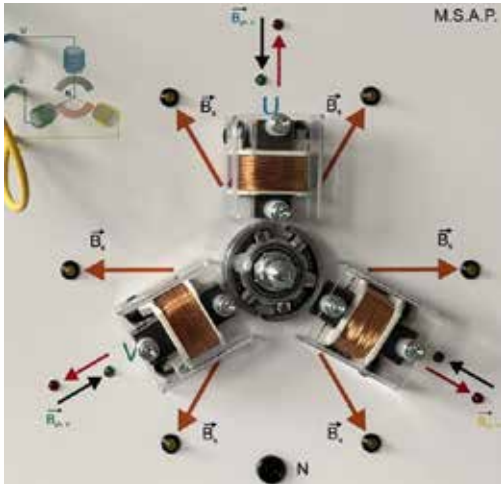
Once you have identified the components of a synchronous motor and its control system, the suggested activities will gradually lead to a comprehensive analysis of a permanent magnet synchronous motor: PMSM.

PERMANENT MAGNET SYNCHRONOUS MOTOR

TRAINING ACTIVITIES

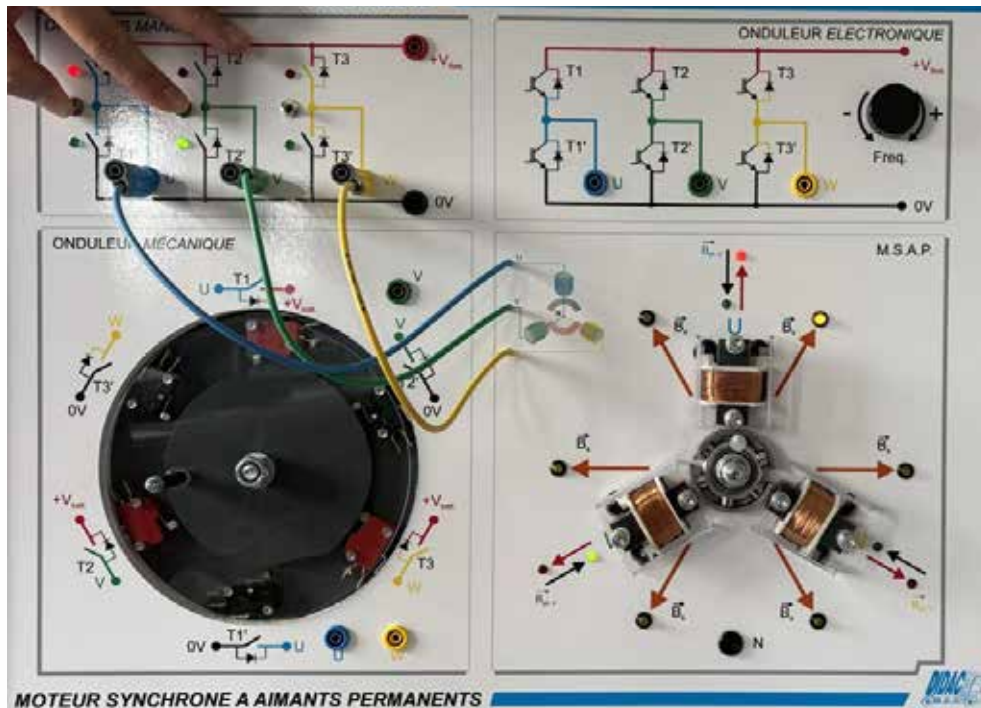
The various activities help develop the following skills:

- 1) Identify the electromagnetic fields of the stator and rotor.
- 2) Identify and quantify the electromagnetic torque.



Apply power to a coil (+/-). The LED on the coil corresponding to the polarity lights up (red or green). The rotor aligns with the coil's magnetic field. Reverse the polarity: the rotor's position changes. Angularly offset the rotor by pulling on it with a weight. Demonstrate that the torque is maximum when the angle between the coil field and the rotor field is 90°.

- 3) Identify the stator's rotating field.



Operate the switches: the LEDs on the phases (coils) light up depending on the polarity and indicate the direction of each coil's magnetic field—outward or inward.

Use this to determine the angular position of the stator field (resulting from the fields of the two phases). Verify the position using the LEDs on the motor control board.

Achieve a full rotation by controlling the switches sequentially and in the correct order. This produces the rotating stator field.

4) Analyze the operation of the “dynamic” inverter and then the electronic inverter.

Wire the motor to the “dynamic” inverter

Check that the motor rotates continuously.

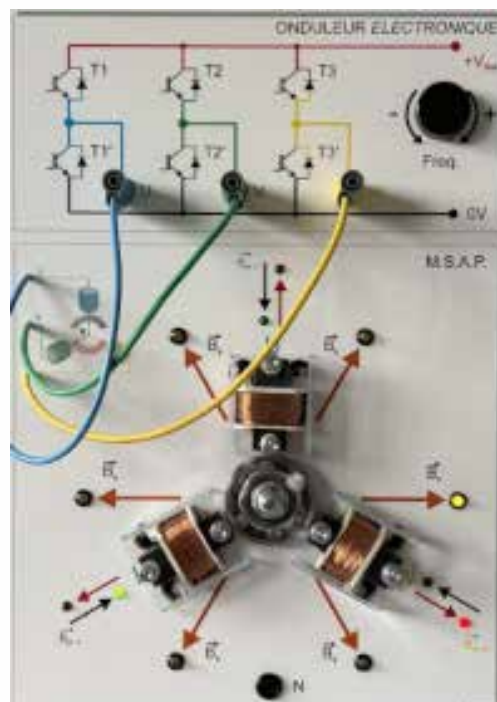
Check that the rotational speed varies in response to the inverter’s control speed.



Supplied with a fully protected 24V 12A fixed power supply.

Wire the motor to the electronic inverter.

Analyze its operation first in on/off control mode and then in PID control mode.



CHARACTERISTICS

Power:

Electric 24V 12A

Dimensions:

L = 600 D = 250 H = 450 mm

Weight:

15 kg

OPTIONS

- Picoscope 4425A - Automotive Series



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MATERIAL HANDLING
EQUIPEMENT





Supplied with a fully protected 24V, 12A fixed power supply.

CHARACTERISTICS

Power:
Electric 24V 12A

Dimensions:
L = 600 D = 250 H = 450 mm

Weight:
15 kg

OPTIONS

- Picoscope 4425A - Automotive Series



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MATERIAL HANDLING
EQUIPEMENT





PRESENTATION

COMPONENTS IN ACTUAL OPERATION: A PRACTICAL APPROACH AND A SUITABLE LEARNING

In fact, this module is made from circuit components from low fuel pressure.

It includes:

- An electric roller pump 12V.
- A pressure regulator 3 bar.
- A valve for controlling the injection amount and the pump flow.
- A display of electrical and hydraulic parameters.
- An electrical failure.
- Sensors (internal) for measuring the voltage and current at the input and the pressure and the output rate.

ACTUAL COMPONENTS RELATED TO ACQUISITION AND ANIMATION SOFTWARE.

In addition to information provided by the display module, the stand is connected to the PC through USB and opens up a whole field of learning activities in which students measure, observe and analysis independently.

The software contains four parts: "Resource", "Animation in real time", "Acquisition" and finally "Study of Pump control and Regulation."

FUEL PUMP

TRAINING ACTIVITIES

The study of the complete circuit shows how is realized the regulation of pressure. It allows the student to highlight the internal functioning of the pressure regulator.

It also shows the limits of the performances of the regulator associated with the pump. It highlights finally the influence of the power supply of the pump (resistant connecting system).

Examples of studies:

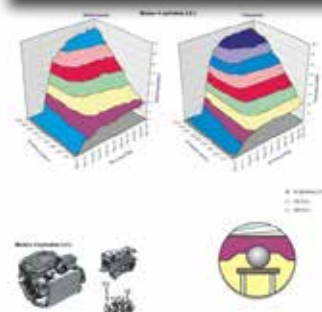
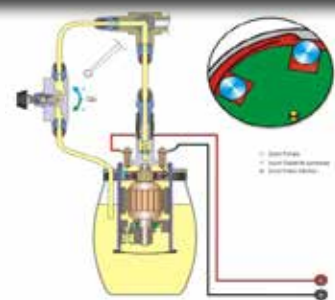
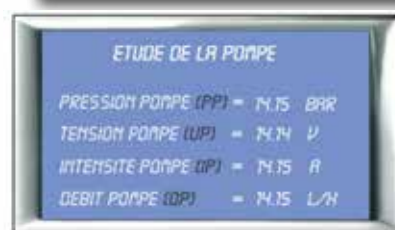
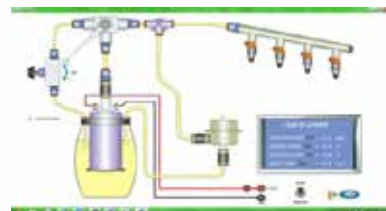
- Role of pressure generator.
- Influence of the injected quantity.
- Check and determination of the characteristics of the regulator. Waterproof circuit (trap, injector).
- Application of the standard and the translation of the real circuit in diagram.
- Methodology of control circuit (setting-up of the manometer, been of the flow pump).

The pump alone is also studied and highlighted the role of the pump and the notions of FLOW AND PRESSURE:

Reading the characteristics: pressure / flow and current / voltage.

- Drawn of the curve of overall efficiency.
- Study of the hydraulic characteristics: capacity, volume efficiency and internal leaks.
- Influence of a defect of power supply.

This module complies with the requirements of French National Education. A complete technical and pedagogic documentation set is supplied on USB drive.



CHARACTERISTICS

Power:
220 V 50 Hz

Weight:
20 kg

OPTION

- Protective cover

☒ EQF 3
Vocational
training

☒ EQF 4
Secondary voca-
tional diploma

☒ EQF 5
Higher technical
diploma

☐ EQF 6+
Higher education

AUTOMOTIVE
MOTORCYCLE





Ref.: ANA-BVM

This training simulator is used to study gearbox both from the functional (adaptation to the engine and the vehicle, calculation of ratios, study of synchronization) and structural perspectives (drivetrain, design, rotation guides, sealing, etc.).

It is particularly well suited to teach functional and structural analysis, mechanical and technological aspects and to practical exercises.

PRESENTATION

A chassis on castors with:



A cutaway gearbox with a variable speed rotational drive (normal, and extra slow speeds).



A clutch and the control mechanism, the transmissions



The gearbox controls



A control panel (meter accelerator and clutch pedal, gear level)

An equipped measurement system:

- Speed and position sensor
- An acquisition card inside the chassis and connected to a PC by a USB cable.

MANUALLY CONTROLLED GEARBOX

A software with :

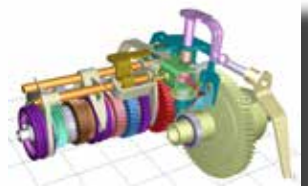
- A section to discover the gearbox (2D and 3D)
- A section to use to animate the 2D images of the gearbox on the screen in real time.
- A section used to take measurements during the various operating phases, and during synchronization in particular.
- A replay function of the measurements that animates the internal parts of the gearbox (synchronization ring, gears, etc.).



TRAINING ACTIVITIES

After completing these activities, trainees will be able to:

- Locate the components on the vehicle.
- Locate and identify the various components of a gearbox.
- Analyze the function of the gearbox (calculation of ratios, ranges, adaptation to the engine and the vehicle).
- Identify the various components of a synchronizer.
- Demonstrate the need for a synchronizer.
- Analyze the various phases of the synchronizer.
- Analyze the malfunctions of a synchronizer.



The structure of the model adopts a very concrete approach to the study of a gearbox. Moreover, the software can be used to analyze the ratios and, in particular, the synchronizer, in very close detail.



This educational set complies with the requirements of French National Education. A complete technical and pedagogic documentation set is supplied on USB drive.

EXCLUSIVITY: a software (on PC) controlling images from the simulator will be delivered with the model detailing all phases of functioning with detailed analysis of every component.



TOPICS COVERED

- The measurements are “replayed” in order to analyze the gear shift phase (speed of the gears before shifting, required speed, action of the synchromesh, etc.)
- The digital models provided can be used to perform a concrete and precise study of each of the parts.

This set is very relevant in the teaching of the analysis systems.

CHARACTERISTICS

Power:
Electric 220 V 50 Hz

Dimensions:
L = 1300 D = 700 H = 1000 mm

Weight:
100 kg

Option: Protective cover

☒ EQF 3

Vocational training

☒ EQF 4

Secondary vocational diploma

☒ EQF 5

Higher technical diploma

☒ EQF 6+

Higher education

AUTOMOTIVE

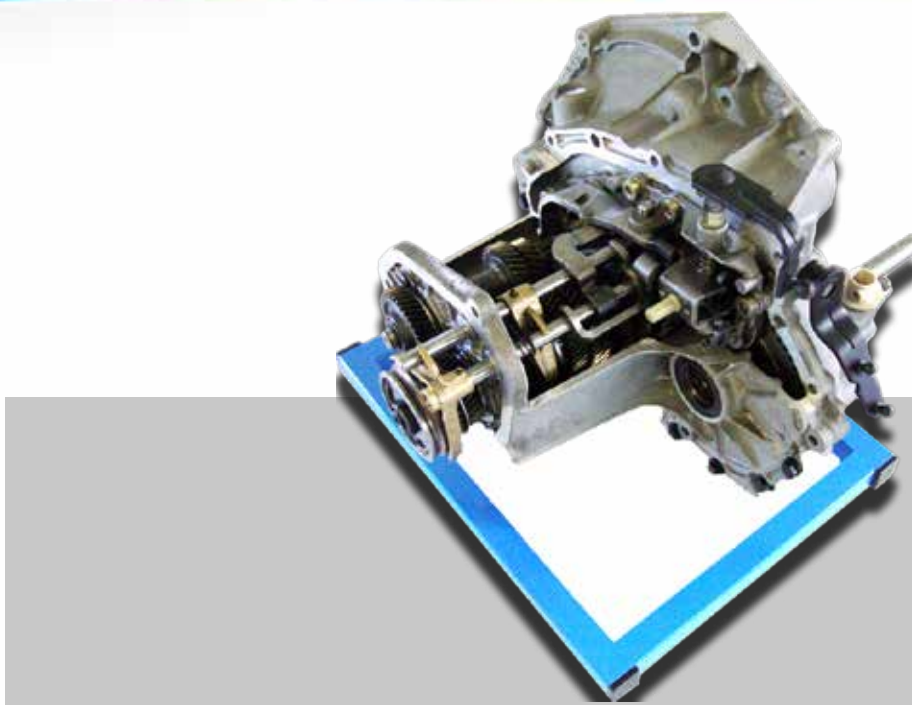
TRUCKS

AGRICULTURAL
MACHINERY

CONSTRUCTION

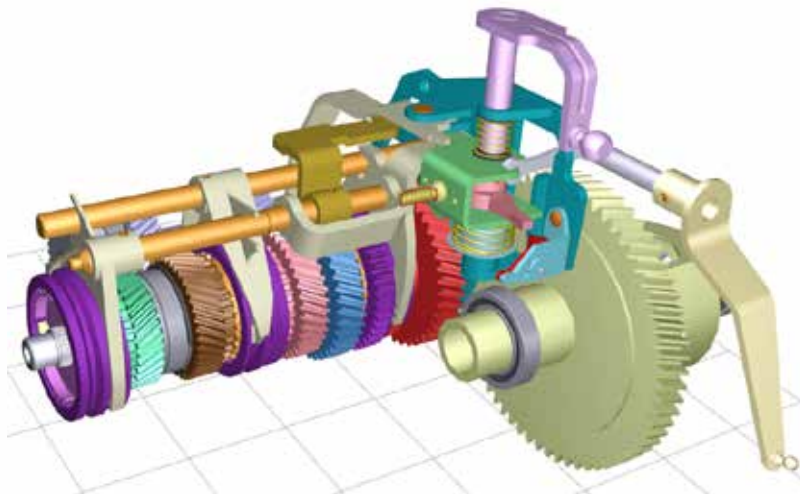


MA5 GEARBOX CUTAWAY



Ref.: ACC-SUP.BVM

The digital model 3D is supplied with the real gearbox. It published with SolidWorks or quite other viewer 3D (without license).



The model is on nonskid feet.

MA5 GEARBOX CUTAWAY

TRAINING ACTIVITIES

Lab #1: Perform a functional analysis of a system (overall function, identification of components, minimal kinematic diagram)

Lab #2: Perform a structural analysis of a system (study of movements and connections, safety during gear shifts)

Lab #3: Verify performance (measure the speeds of the various gears, determine the gear ratios for each pair of gears, verify the calculated values)

CHARACTERISTICS

Dimensions:

L = 600 D = 600 H = 550 mm

Weight:

25 kg

☒ EQF 3

Vocational training

☒ EQF 4

Secondary vocational diploma

☒ EQF 5

Higher technical diploma

☒ EQF 6+

Higher education

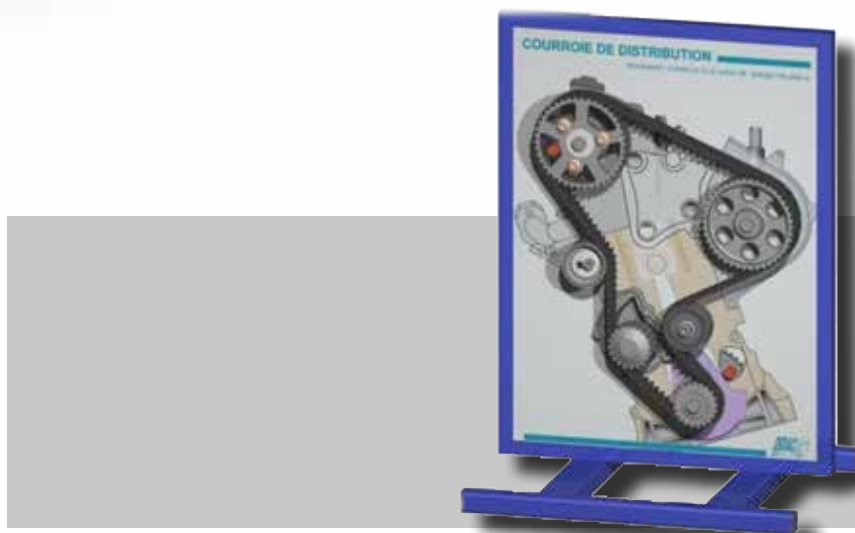
AUTOMOTIVE

TRUCKS

CONSTRUCTION

AGRICULTURAL
MACHINERY





Ref.: ANA-CD

The timing belt links the crankshaft to the camshaft through the coolant pump and the injection pump. The path of the belt is determined by the position of the gears and rollers.

The damage caused to an engine's transmission system by the deterioration of the timing belt can bring the vehicle to a standstill and can even partly destroy the engine, resulting in costly repairs.

It is highly advisable to replace both the timing belts and the belt tightener and idlers at the same time as a preventive measure according to the manufacturer's recommendations, and to carefully adjust the tightness of the notched belt.

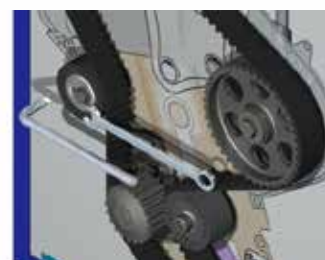
New methods have been developed to improve the precision of the tightness settings that consist essentially in blocking the shafts while the allowing the pulleys to rotate.

PRESENTATION

The model of the timing belt consists of a console comprising the pulleys, the belt tighteners and idler and the belt, which are all positioned like in a real engine.

The following elements are supplied :

- conventional tools used to adjust the tightness,
- a tool used to measure the tightness when installing,
- a kit of spare rollers for teaching purposes,
- 3D digital models of the transmission parts.



TIMING BELT

TRAINING ACTIVITIES

This tool can be used to deal the functional, structural and mechanical analyses that are part of the requirements of the French National Education. Students work on a mechanical subassembly on a bench using real tools in a real-life situation.

After completing these activities, students will be able to:

- Identify a power transmission solution:
 - Real components are used
- Identify the parameters that impact operation, life time and maintainability:
 - Study the tightness settings by actually removing and installing the timing belt using modern methods.
 - Comparative study of the method used and the old method that involved blocking the pulleys.
- Anticipate changes, draw up a repair method and produce the materials required in order to understand:
 - While removing/installing the timing belt with a new kit of spare rollers, the technician is unable to tighten the belt tightener.
 - Identification of a solution (replacement of the nuts and bolts, discussion of the set of measurements).
 - Production of the technical documentation (repair method) describing the solution.



An educational kit is supplied on USB drive.

Approached subjects:

CI4: transmission, conversion and use of mechanical energy.

CI6: producing technical documents.

CHARACTERISTICS

Dimensions:

L = 450 D = 360 H = 550 mm

Weight:

30 kg

☐ EQF 3

Vocational training

☒ EQF 4

Secondary vocational diploma

☒ EQF 5

Higher technical diploma

☐ EQF 6+

Higher education

AUTOMOTIVE





Ref.: ANA-EMB

The clutch system is a device of temporary coupling for performing the change of gearbox. Because of its transmission by adhesion, it offers a progressive load of mating layout, which avoids the jerks.

There are three operating positions:

- The put into gear position: the clutch fully transmits the power input, the car rolls because the motor shaft is linked to the shaft of the gearbox.
- Declutch position: The transmission is interrupted; freewheels or stopped car, the engine can continue to turn without the wheels. This situation is identical that to be in neutral.
- Slipping the clutch or transitional period: it is a period between clutch disengaged and the clutch fully engaged (or vice versa). The driving steering wheel and the primary shaft drive do not turn with the same speed; there is then sliding between disks, thus waste of energy, in the warm form. This phase allows to synchronize the engine and the gearbox that is to bring them to the same rotation speed. The clutch wear takes place during this phase.

PRESENTATION

The clutch model is presented in a frame including the clutch and its mechanical device associated with a primary shaft drive blocked in rotation to be able to measure the couple which is passed on transmitted it, the pedal and its cable with system of catching up play and a desk with two display to read in real time the transmitted couple and the effort pressure (instrumented by integrated sensors).

All these elements are positioned such as in the reality.



The simulator is supplied with 3D digital models with the clutch and with the plan of backlash compensation mechanism.

CLUTCH

TRAINING ACTIVITIES

This tool can be used to deal the functional, structural and mechanical analyses that are part of the requirements of the French National Education. Students work on a mechanical subassembly on a bench using real tools in a real-life situation.

After completing these activities, students will be able to:

- Identify a solution of clutch (specificities, characteristics, of disk and the mechanism composition): Component are real (An "exploded view" disk is supplied as a supplement to the model insuring a detail structural study).
- Analyze and justify the employment of all the essential parts of the mechanism of clutch by the calculation or the real measures (packing, diaphragm, disk of progressiveness, competences of amortization, and disks of friction).
- Identify the influential parameters on the functioning, understand the influence of the disk clutch wear on the transmitted and highlight the interest of a diaphragm to insure the effort to pressure.
- Highlight the necessity of the catching up of the play, understand the principle of functioning of the automatic system and understand a method of intervention



An educational kit is supplied on USB drive.

The model is mounted on anti-skid feet.

Approached subjects:

CI4: transmission, conversion and use of mechanical energy.

CHARACTERISTICS

Power:

220 V 50 Hz

Dimensions:

L = 850 D = 750 H = 700 mm

Weight:

90 kg

☐ EQF 3

Vocational training

☒ EQF 4

Secondary vocational diploma

☒ EQF 5

Higher technical diploma

☐ EQF 6+

Higher education

AUTOMOTIVE

TRUCKS

**AGRICULTURAL
MACHINERY**

CONSTRUCTION

**MATERIAL HANDLING
EQUIPEMENT**



PA6 SEMI-AUTOMATIC GEARBOX CONTROL MODULE



Ref.: ANA-BVR.PA6

Since the advent of multiplexing, and communications between the gearbox and engine control systems, semi-automatic gearboxes have been developed for LCVs. The benefits in terms of consumption and a comfortable drive are obvious. Many manufacturers have installed these systems in their vehicles, which are widely used by professionals.

This simulator is based on the latest transmission system developed by RENAULT.

A semi-automatic gearbox is a manual gearbox fitted with a system that automates gear shifts.

This add-on is made up of two electro-hydraulic actuators that shift the gears, one master-slave actuator that operates the clutch and a hydraulic generator that supplies the energy required by the actuators.

This training simulator faithfully reproduces the workings of a Master fitted with a PA0 gearbox with six forward speeds using a sophisticated simulation that is totally transparent for the user. The connections between the ECUs are reproduced to recreate the usual environment of a gearbox ECU.

PRESENTATION

The ECU gearbox and engine ECU



The diagnostic connector



The shift rails and selector forks



The dashboard with the controls and indicators associated with the semiautomatic gearbox



The clutch



The print of the gearbox with the pawls and synchronizers.

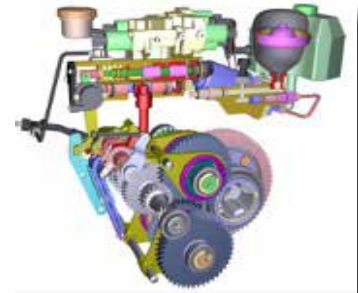


PA6 SEMI-AUTOMATIC GEARBOX CONTROL MODULE

TRAINING ACTIVITIES

After completing the proposed activities, students will be able to:

- Locate the gearbox on the vehicle.
- Locate and identify the various components of the system.
- Identify the components of the gearbox and clutch control system (actuators, sensors, and selection and engagement systems).
- Analyze the gear shifts (control cycles of the actuators, synchronization phase)
- Analyze the gear shift modes (the gear shift laws in the different modes, various safety mechanisms)
- Analyze the electric signals exchanged between the different components (analog signals of the actuators and sensors and multiplexed signals).
- Perform fault-finding and diagnostic operations using conventional tools and the manufacturer's tools.



The quantity of actual original components and the advanced simulation allow trainees to make work on concrete cases under conditions close to real life in complete safety.

This model complies with the requirements of the French National Education.

An educational document set is supplied on USB drive.

EXCLUSIVITY: Each model is associated with PC software used to control the images from the simulator that gives details of all the operational phases, with a detailed analysis of each component. Consequently, this tool is suitable to the analysis systems education.



TOPICS COVERED

- Notions of onboard electronic systems.
- Sensors, pre-actuators and actuators.
- Study of double effect actuators and the specifics of midpoint actuators.
- Gear controls, locking, mechanical and electronic synchronism.
- Study and calculation of gear ratios (reasons for conventional and epicyclic trains).
- Notions of ECU and sensor settings.
- Diagnostics with smart (RT DIAG) and conventional tools (commercial vehicles).
- Measurement acquisition with conventional acquisition systems.

CHARACTERISTICS

Power:
220 V 50 Hz

Dimensions:
L = 1400 D = 700 H = 1000 mm

Weight:
80 kg

☐ EQF 3
Vocational training

☒ EQF 4
Secondary vocational diploma

☒ EQF 5
Higher technical diploma

☒ EQF 6+
Higher education

AUTOMOTIVE

TRUCKS
CONSTRUCTION

AGRICULTURAL
MACHINERY





Ref.: ANA-CI

This training desk proposes the study of a receiver dashboard of motor vehicle on a multiplex network CAN.

PRESENTATION

- An instrument cluster learnt on a command and connect desk
- An USB-CAN adapter.
- A reception software/data transmission CAN.
- A decoding software of a CAN oscillogram.
- An USB drive including: teaching application, resources, and software.



TRAINING ACTIVITIES

Understanding how the dashboard and the bus CAN work:

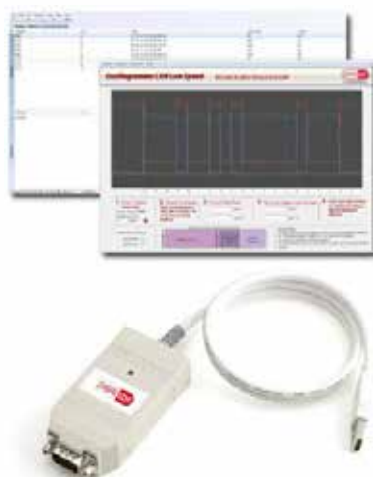
- Functional and structural analysis of the information channels. (file SysML)
- Discovery the different vehicle networks.
- To take advantage of bus CAN
- Duration: 3h

INSTRUMENT CLUSTER

Targeted skills	Knowledge
- CO3.1 To decode the functional specifications of a system. - CO4.1. To identify and characterize the functions and system components as well as its in/out - CO4.2. To identify and characterize organization of material and/or software system - CO4.4. To identify and characterize technical solutions relative to materials, to structure, to energy and to information (acquisition, treatment, transmission) system	- 2.1 Functional system approach - 2.3.6 Informative system's behavior - 3.2.4 Transmission the information, network and web
Understanding	Abilities
Architectural network (topology, mode of communication, type of transmission, method of access to the support, the technical switching)	Identify network's functional and material architectural

STUDY OF THE CAN BUS FROM THE PHYSICAL LAYER TO THE APPLICATION LAYER

- Study the model ISO layers.
- Physical layer: signal's measure, the pupil understands how are obtained the logical levels.
- Link layer: oscillogram decoding (software supplied), the pupil understands the frame constitution
- Application layer: Frame reception and new frame creation (Adapter USB and software communication CAN supplied). The student understand the information frame coding.
- Duration: 3h.



Targeted skills	Knowledge
- CO3.1 Interpret the functional specifications of a system. - CO4.1. Identify and characterize the functions and components of a system, as well as its inputs and outputs. - CO4.2. Identify and characterize the hardware and/or software architecture of a system. - CO4.4. Identify and characterize technical solutions related to the materials, structure, energy, and information (acquisition, processing, transmission) of a system.	- Functional Approach to a System - Informational Behaviors of Systems - Information Acquisition and Encoding - 3.2.4 Information Transmission, Networks, and the Internet.
Understanding	Abilities
Number systems, coding	Analyze and interpret numerical data
OSI Model	Describe the structure of the main protocols
Communication Networks Communication media, concept of protocols, configuration parameters. Concept of frames, serial and parallel connections.	Analyze formats and information flows Identify functional and hardware architectures Identify communication media Identify and analyze the transmitted message, the concept of a protocol, and configuration parameters

CHARACTERISTICS

Power:
220 V 50Hz

Dimensions:
L = 400 D = 300 H = 300 mm

Weight:
6 kg

Software and documentation provided on a USB drive.

OPTION

- Picoscope 4425A - Automotive Series



☐ EQF 3

Vocational training

☒ EQF 4

Secondary vocational diploma

☒ EQF 5

Higher technical diploma

☒ EQF 6+

Higher education

AUTOMOTIVE





Ref.: ANA-BC.J1939.G2

The instrument panel is the primary interface between the driver and the vehicle.

Today's instrument panels are multiplexed and communicate with the entire vehicle.

DIDAC BDH has developed a module that controls the various displays on the instrument panel. Multiplexed data frames are thus generated and exchanged with the instrument panel.

PRESENTATION

The model is presented in the form of a console comprising:

- A COBO ECO HE matrix-style instrument panel (rev counter, speedometer, gauges, indicators, warning lights) and two gauges with LED indicators (fuel and coolant).
- A settings panel: engine speed, coolant temperature, major and minor fault indicators, vehicle speed, parking brake information, tyre pressure, fuel level, AdBlue level, brake fault indicator.
- A power switch (equivalent to +APC) for the unit.
- Four sockets (plus a ground), connected to the bus, allowing a frame analyser to be connected.
- A 220V socket block with an integrated fuse for the power supply.
- An electronic board for generating data frames in standalone mode: user commands.
- A USB CAN adapter.
- CAN reception/transmission software.
- A USB stick containing: teaching resources (resource folder, user guide, Practical Exercises: Teacher / Student).

J1939 CAN BUS

This module can be used in two operating modes:

- Standalone: The circuit board generates frames based on parameter changes made by the user.
- Frame simulation: The user disconnects (using cables) the J1939 bus from the circuit board and then connects an analyzer to a PC to generate frames and update the COBO display.



LEARNING OBJECTIVES

Upon completion of the proposed activities, the student will be able to:

- Identify the system components:
The multiplexed architecture is shown.
Photos of the control units and their parameters are displayed on the workbench along with their electrical connections.
- Analyze system operation:
Study and decode the various data frames required for the instrument panel to function.
- Perform diagnostic procedures:
Faults (short circuits, open circuits) can be simulated using jumpers, and the student observes the associated degraded operating modes.

Students approach multiplexed systems through a hands-on, practical, and engaging method. Initially, they can observe data exchange. Once the data has been decoded, they can then validate their understanding of how the system works by generating the correct data frames for the instrument panel themselves.

A FUN AND VERY PRACTICAL APPROACH.

Hands-on Activities: Study of the CAN bus from the physical layer to the application layer.

- Study of the layers of the OSI model.
- Physical layer: signal measurement; students learn how logic levels are formed.
- Link layer: Decoding an oscillogram (tutorial provided); students understand the structure of the frame.
- Application layer: Receiving frames and creating new frames (USB adapter and CAN communication software provided); students understand how information is encoded within the frame.

TOPICS COVERED

- Data display, analogue-to-digital conversion.
- Multiplexed automotive networks: CAN (low-speed, high-speed) and LIN
- The concept of proprietary/'manufacturer-specific' messaging
- Frame decoding and analysis system (CANALYSER).
- Network diagnostics (multimeter, CANALYSER)

CHARACTERISTICS

Power:

Electric 220 V 50 Hz

Dimensions:

L = 600 D = 250 H = 500 mm

Weight:

14 kg

Supplied with a protective cover.

OPTION

- Picoscope 4425A - Automotive Series



☐ EQF 3

Vocational training

☒ EQF 4

Secondary vocational diploma

☒ EQF 5

Higher technical diploma

☒ EQF 6+

Higher education

MOTORCYCLE

TRUCKS

AGRICULTURAL
MACHINERY

CONSTRUCTION

MATERIAL HANDLING
EQUIPEMENT





Ref.: ANA-DAE

This teaching kit enables the study of electric power steering (EPS) from both an electronic and a mechanical perspective.

Benefits of studying EPS:

- EPS is highly representative of on-board electronic systems, with interesting and highly topical features: eddy-current sensors, an electric motor controlled by a chopper, and a CAN bus.
- This system also enables the study of commonly used mechanical systems: motion conversion using a wheel-and-worm gear mechanism and a rack-and-pinion mechanism.

AUTONOMOUS POWER STEERING SYSTEM, EQUIPPED WITH A CRADLE, A LOWER CONTROL ARM, AND A PIVOT.

PRESENTATION

The product includes:

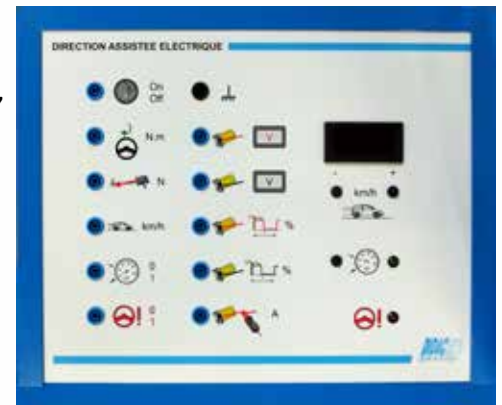
- A mechanical assembly comprising:
 - The subframe of a PSA vehicle, including the lower wishbone and the left-hand pivot.
 - The steering rack, fitted with an electric motor equipped with a current sensor.
- A vehicle control panel comprising:
 - +APC and start button,
 - operational indicator lights,
 - OBD2 diagnostic socket.
- EPS control unit with a Y-splitter harness and a CAN bus fault simulation box.
- 12V battery with a smart charger integrated into the lower section.

ELECTRIC POWER STEERING

- Data acquisition system with integrated instrumentation (force sensors, current and flywheel angle sensors, etc.),



- Complete computer kit: Full HD monitor, mini PC, keyboard, mouse,
- A control/measurement panel with:
 - vehicle speed display,
 - vehicle speed control,
 - engine start,
 - operating indicator lights,
 - a measurement terminal block for acquiring signals using a PicoScope (optional).



- A full operating software package that includes reference documents, real-time 3D digital models, and a data acquisition module (measurements + graphing tool). Analysis menus allow users to study the system by analyzing these real-time measurements.



LEARNING OBJECTIVES

This simulator is particularly effective at helping users develop the following skills:

In the field of functional and structural analysis:

- Identify the components and the various kinematic links of the steering system (from the steering wheel to the wheels).
- Draw all or part of the kinematic diagram of the front suspension.
- Determine the relationship between the rotation of the steering wheel, the movement of the rack, and the angle of the wheels.

- Determine the relationship between the torque applied to the steering wheel and the action of the rack on the steering link:
 - Without power steering
 - With power steering
- Determine the total torque provided by the various components of the system: steering wheel, electric motor, reduction gear, and rack pinion.

In the area of technology and repairs:

- Identify the various system components (control, processing, sensors, actuators).
- Identify the various components involved in the communication between the DAE control unit and the other ECUs (engine, ABS).
- Measure and plot the power steering assist values as a function of vehicle speed.
- Analyze the operation of the torque sensor (eddy current sensor).
- Study the control mode of the DAE's electric motor (4-quadrant chopper, low-assistance mode, high-assistance mode).
- Study the influence of temperature on assistance.
- Read and interpret the parameters provided by the diagnostic tool.
- Analyze the operation of the DAE in degraded mode.

THE IDEAL LINK BETWEEN THE REAL SYSTEM AND THE DIGITAL MODEL.

CHARACTERISTICS

Power:
Electric 220 V 50 Hz

Dimensions:
L = 1 300 D = 700 H = 1 700 mm

Weight:
110 kg

OPTIONS

- Protective cover.
- Picoscope 4425A - Automotive Series



☐ EQF 3

Vocational training

☒ EQF 4

Secondary vocational diploma

☒ EQF 5

Higher technical diploma

☒ EQF 6+

Higher education

AUTOMOTIVE





Ref.: SYS-FPTR

PRESENTATION

The pneumatic braking model consists of two chassis (tractor and trailer) with the various components of a braking system (RENAULT PREMIUM type).

It includes:

- The air dryer.
- The quadruple safety valve.
- The air reservoirs (3 for the tractor and 1 for the trailer).
- The parking/trailer reservoir pressure regulator.
- The service brake valve.
- The parking brake valve.
- The front quick-release valve.
- The two brake equalizers (mechanical for the tractor and pneumatic for the trailer).
- The non-overpressure valve (double relay valve).
- The trailer control valve.
- The front, rear, and trailer brake cylinders and reservoirs.
- Trailer connection fittings with hoses to connect the tractor and the trailer.
- Pressure ports compliant with the manufacturer's circuits.
- Air connections and hoses with safety quick-connect fittings.

All of these components are mounted on panels with adhesive labels showing the outline of the tractor and trailer from a top-down view to illustrate their placement.



PNEUMATIC BRAKING SYSTEM

TRAINING ACTIVITIES

Upon completion of the course activities, students will be able to:

- Identify the various components and their respective inputs and outputs (power supply, control, output pressure, and exhaust). These are identical to those in vehicles (same manufacturer part number).
- Assemble the various components into a functional system.
- Wire the circuit (completely or partially) based on the manufacturer's pneumatic diagrams.
- Take pressure measurements:
 - To verify that the component operates properly in its pneumatic environment.
 - To verify its compliance by comparing it with the manufacturer's specifications.



AN EDUCATIONAL RESOURCE PACK IS PROVIDED WITH THE MODEL ON A USB DRIVE.

TOPICS COVERED

- Pneumatic energy storage
- Protection and safety of pneumatic circuits
- Modulation of pneumatic energy (valves, load compensators and trailer control valves)
- Checking a pneumatic circuit using pressure gauges

CHARACTERISTICS

The two chassis (tractor and trailer) are independent and are equipped with swivel castors.

<u>Power:</u>	<u>Dimensions:</u>	<u>Weight:</u>
Pneumatic: 7 bar	Tractor: L = 1400 D = 700 H = 1700 mm Trailer: L = 700 D = 700 H = 1700 mm	160 kg 95 kg

Hoses for connecting components: 30 x 0.5 m and 5 x 0.75 m
(2 extra hoses, and two fitted with pressure gauges)

OPTIONS

- Protective covers
- Pneumatic test kit



☒ EQF 3

Vocational training

☒ EQF 4

Secondary vocational diploma

☒ EQF 5

Higher technical diploma

☒ EQF 6+

Higher education

TRUCKS

AGRICULTURAL
MACHINERY

CONSTRUCTION





Ref.: SYS-FE

PRESENTATION

This model for studying electrical functions takes the form of a workbench featuring:

- on one side, a screen-printed top view of a commercial vehicle, enabling the study of the electrical functions of the 'CHASSIS'.
- on the other side, a screen-printed view of a driver's cab, enabling the study of the electrical functions of the 'CABIN'

This configuration allows two groups of students to work simultaneously and independently.

On each side, depending on the function being studied, the circuit boards carrying the actual electrical components can be fitted instantly.

In addition to the components, each circuit board features a screen-printed electrical diagram and female banana plugs fitted at the connection points.

A lockable storage compartment is integrated into the model (on each side), enabling easy storage of the circuit boards and cables supplied with the model.

Swivel castors allow for easy movement, and the overall dimensions are suitable for use in a workshop, laboratory or classroom.

A built-in 24V power supply per side is supplied with the model.

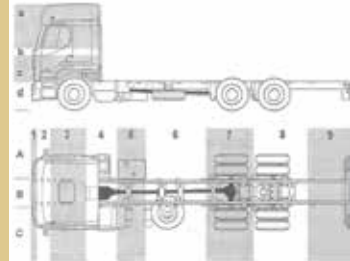


ELECTRICAL FUNCTIONS

TRAINING ACTIVITIES

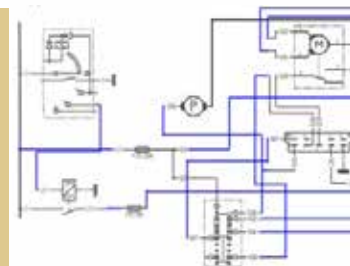
STUDY OF THE ELECTRICAL FUNCTIONS OF THE CHASSIS.

- Main lighting: position lights, dipped-beam headlights, full-beam headlights
- Additional lighting: fog lights and high-beam headlights
- Brake lights and reversing lights
- Indicator lights and hazard warning lights



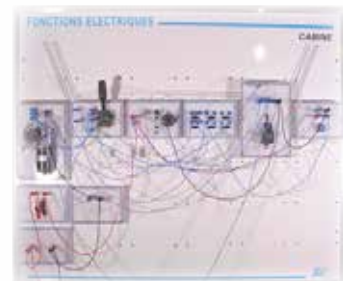
STUDY OF THE ELECTRICAL FUNCTIONS OF THE CABIN.

- Engine start and stop control circuit
- Immobiliser and central locking
- Windscreen wipers and windscreen washers
- Window lifters



The skills developed are:

- Identify an electrical component and its connections to the vehicle.
- Locate its position on the vehicle using the manufacturer's wiring diagrams.
- Wire these components using the diagram.
- Check that it is working correctly.
- Measure electrical parameters and verify that it is working correctly.
- Troubleshoot a faulty assembly.



This model allows two groups of pupils to work independently and effectively, one on each side.

THE STUDENT IS THEREFORE FACED WITH A FORMALISED SYSTEM COMPRISING ELEMENTS THAT OPERATE WITHIN THEIR NORMAL CONTEXT.

An educational pack is supplied with the model (on a USB stick).

CHARACTERISTICS

<u>Power:</u>	<u>Dimensions:</u>	<u>Weight:</u>
220 V 50 Hz	L= 1400 D= 700 H= 1700 mm	250 kg

OPTIONS

- Protective cover.
- Picoscope 4425A - Automotive Series



☒ EQF 3

Vocational training

☒ EQF 4

Secondary vocational diploma

☒ EQF 5

Higher technical diploma

☐ EQF 6+

Higher education

TRUCKS

AGRICULTURAL
MACHINERY

CONSTRUCTION

MATERIAL HANDLING
EQUIPEMENT



CUMMINS B6.7 BENCH-MOUNTED ENGINE



Stationary engine
6-cylinder
Common-rail engine



Ref.: SYS-MSB.B6.7

This bench-mounted engine features new technology and enables the manufacturer to comply with Stage V standards (equivalent to Euro 6). It is fitted with a common-rail injection system combined with a comprehensive emissions control system:

- DOC: Diesel oxidation catalyst
- DPF: Diesel particulate filter
- SCR: Urea injection with a catalytic converter

This modern system therefore enables us to address, in addition to the injection system, a wide range of areas relating to the engine (charging system, starting system, turbocharging, cooling, lubrication, timing, etc.).



THE DESIGN IS PERFECTLY SUITED TO THE ENVIRONMENT OF AN INDUSTRIAL STATIONARY ENGINE, OFFERING UNPARALLELLED ACCESS TO COMPONENTS.

THIS INSTALLATION IS APPROVED BY CUMMINS TO MEET THE REQUIREMENTS OF THE WARRANTY PROCESS.

CUMMINS B6.7 BENCH-MOUNTED ENGINE

PRESENTATION

This bench includes:

- **an engine:**

- Type B6.7, 6-cylinder, 6.7 L displacement, 285 CH (210 kW)
- Engine with variable-geometry turbocharger (sliding type)
- Intake air preheater
- Aftercooling
- Engine intake air accelerator
- Single-module emission control systems: Oxidation catalyst (DOC), diesel particulate filter (DPF), selective catalytic reduction with urea injection (SCR), 2 NOx sensors (upstream and downstream) and temperature sensors.
- Exhaust pressure regulator
- Fuel and AdBlue tanks



- **a fully equipped control panel:**

- A bistable button, locked with a key, for engaging the +APC, and a push-button for starting (controlled starter motor)
- a COBO display showing: engine speed (rpm), coolant temperature (°C), fuel and AdBlue levels, battery voltage (V), warning lights relating to emissions control and regeneration phases, and major and minor fault codes (SPN).
- an accelerator pedal
- controls for managing accelerated idle speed and DPF regeneration (key-operated lock)
- a fuse/relay board
- an emergency stop button.

- **a measurement terminal block and a fault simulation box:**

- The ideal and practical solution for carrying out measurements and fault simulation on all inputs and outputs of the engine control module (ECM). All whilst preserving the vehicle's wiring harness!
- The fixed front panel incorporates the sockets and accommodates the external covers corresponding to the ECM.
- The base of the box is fitted with a door, featuring an integrated lock (2 keys supplied), providing access to the fault-simulation points.
- Each channel is protected by internal fuses. For each channel, we can simulate an open circuit, a short circuit to earth and three in-line resistors (1 kΩ, 10 kΩ and 56 kΩ).
- This fault simulation box is removable via a two-position rotary mechanism to facilitate access to the fault compartment.

- **security features:**

- a liquid retention tray
- a battery cut-off switch.

TRAINING ACTIVITIES

Upon completion of the activities, the student will be able to:

- to identify the various components of an internal combustion engine.
- to describe and analyse the operation of the engine (valve train)
- to identify, describe and analyse the air system (supercharging)
- to identify, describe and analyse the exhaust system (supercharging and brake)
- to identify, describe and analyse the operation of the charging, starting, cooling and lubrication systems.
- to identify, describe and analyse the operation of the fuel injection and emission control systems.
- to measure multiple fuel injections per cylinder
- to carry out measurements on the various sensors and actuators and analyse their operating principles and control methods.
- to read and interpret electrical diagrams.
- to use diagnostic tools: a display unit and a CUMMINS or multi-make manufacturer's diagnostic tool
- to diagnose the various engine systems, in particular the fuel injection system.

The bench comes with a very comprehensive set of documentation, enabling trainers to quickly implement the various practical exercises provided.

It has a very wide range of educational applications.

The design offers unrivalled accessibility and visibility.

Access to the manufacturer's server is included and linked to the serial number of the engine supplied.

SOFTWARE AND DOCUMENTATION SUPPLIED ON A USB STICK.

CUMMINS B6.7 BENCH-MOUNTED ENGINE

CHARACTERISTICS

Dimensions:

L = 1800 D = 1400 H = 1700 mm

Weight:

1100 kg

OPTION

- Picoscope 4425A - Automotive Series



☒ EQF 3

Vocational training

☒ EQF 4

Secondary vocational diploma

☒ EQF 5

Higher technical diploma

☒ EQF 6+

Higher education

TRUCKS

AGRICULTURAL
MACHINERY

CONSTRUCTION



CUMMINS F3.8 BENCH-MOUNTED ENGINE



**Stationary engine
4-cylinder
Common-rail engine**

Ref.: SYS-MSB.F3.8

This bench-mounted engine features new technology and enables the manufacturer to comply with Stage V standards (equivalent to Euro 6). It is fitted with a common-rail injection system combined with a comprehensive emissions control system:

- DOC: Diesel oxidation catalyst
- DPF: Diesel particulate filter
- SCR: Urea injection with a catalytic converter

This modern system therefore enables us to address, in addition to the injection system, a wide range of areas relating to the engine (charging system, starting system, turbocharging, cooling, lubrication, timing, etc.).



THE DESIGN IS PERFECTLY SUITED TO THE ENVIRONMENT OF AN INDUSTRIAL STATIONARY ENGINE, OFFERING UNPARALLELLED ACCESS TO COMPONENTS.

THIS INSTALLATION IS APPROVED BY CUMMINS TO MEET THE REQUIREMENTS OF THE WARRANTY PROCESS.

CUMMINS F3.8 BENCH-MOUNTED ENGINE

PRESENTATION

This bench includes:

- **an engine:**
 - Type F3.8, 3.8 L, 3-cylinder engine, 175 CH (129 kW)
 - Densor Common Rail diesel engine
 - Engine equipped with a fixed-geometry turbocharger with wastegate
 - Intake air heater
 - Aftercooling
 - Single-module emissions control systems: Oxidation catalyst (DOC), diesel particulate filter (DPF), selective catalytic reduction with urea injection (SCR), 2 NOx sensors (upstream and downstream), and temperature sensors.
 - Exhaust pressure regulator
 - Fuel and AdBlue tank
- **a fully equipped control panel:**
 - A bistable button, locked with a key, for engaging the +APC, and a pushbutton for starting (controlled starter)
 - A COBO display showing: engine speed (rpm), coolant temperature (°C), fuel and AdBlue levels, battery voltage (V), indicator lights for emissions control and regeneration phases, and major and minor fault codes (SPN).
 - An accelerator pedal
 - Controls for managing accelerated idle speed and DPF regeneration (key-locked)
 - A fuse/relay panel
 - An emergency stop button.
- **a measurement terminal block and a fault simulation box:**
 - The ideal and practical solution for carrying out measurements and fault simulation on all inputs and outputs of the engine control module (ECM). All whilst preserving the vehicle's wiring harness!
 - The fixed front panel incorporates the sockets and accommodates the external covers corresponding to the ECM.
 - The base of the box is fitted with a door, featuring an integrated lock (2 keys supplied), providing access to the fault-simulation points.
 - Each channel is protected by internal fuses. For each channel, we can simulate an open circuit, a short circuit to earth and three in-line resistors (1 kΩ, 10 kΩ and 56 kΩ).
 - This fault simulation box is removable via a two-position rotary mechanism to facilitate access to the fault compartment.
- **security features:**
 - a liquid retention tray
 - a battery cut-off switch.
 - a set of protective measures for rotating parts, hot parts, and batteries (Rotating Machinery Directives).



TRAINING ACTIVITIES

Upon completion of the activities, the student will be able to:

- to identify the various components of an internal combustion engine.
- to describe and analyse the operation of the engine (valve train)
- to identify, describe and analyse the air system (supercharging)
- to identify, describe and analyse the exhaust system (supercharging and brake)
- to identify, describe and analyse the operation of the charging, starting, cooling and lubrication systems.
- to identify, describe and analyse the operation of the fuel injection and emission control systems.
- to measure multiple fuel injections per cylinder
- to carry out measurements on the various sensors and actuators and analyse their operating principles and control methods.
- to read and interpret electrical diagrams.
- to use diagnostic tools: a display unit and a CUMMINS or multi-make manufacturer's diagnostic tool
- to diagnose the various engine systems, in particular the fuel injection system.

The bench comes with a very comprehensive set of documentation, enabling trainers to quickly implement the various practical exercises provided.

It has a very wide range of educational applications.

The design offers unrivalled accessibility and visibility.

Access to the manufacturer's server is included and linked to the serial number of the engine supplied.

SOFTWARE AND DOCUMENTATION SUPPLIED ON A USB STICK.

CUMMINS F3.8 BENCH-MOUNTED ENGINE

CHARACTERISTICS

Dimensions:

L = 1500 D = 1300 H = 1600 mm

Weight:

800 kg

OPTION

- Picoscope 4425A - Automotive Series



☒ EQF 3

Vocational training

☒ EQF 4

Secondary vocational diploma

☒ EQF 5

Higher technical diploma

☒ EQF 6+

Higher education

TRUCKS

AGRICULTURAL
MACHINERY

CONSTRUCTION



BENCH-MOUNTED NON-RUNNING ENGINE



Automotive Engine
4-cylinder diesel or
3-cylinder petrol

Ref.: SYS-MSBNT.D
SYS-MSBNT.E

Photos are not contractually binding

Powertrain (engine, clutch, transmission) not running to allow for removal and reinstallation of components: timing system, clutch, cylinder head gasket, etc.

THE INSTALLATION FITS PERFECTLY INTO THE ENGINE COMPARTMENT.

PRESENTATION

- The powertrain consists of a real engine, clutch, and transmission.
- The assembly is mounted using the original rubber mounts on a mechanically welded chassis coated with a durable epoxy-type paint and equipped with four swivel casters, two of which have brakes.
- The original mounting points are preserved to allow for the installation and use of an engine cross member, or the use of a rolling jack under the powertrain or a jack stand, depending on the vehicle type.
- The layout of the engine compartment is reproduced:
 - The side wheel wells under the fenders
 - The front fascia
 - The front end, featuring the radiator assembly.
- All of these parts will be secured with screws and will therefore be removable.
- Students will be able to take the vehicle apart and put it back together, just as they would with a real vehicle.



CHARACTERISTICS

Dimensions:

L = 1200 D = 850 H = 1200 mm

Weight:

260 kg

☒ EQF 3

Vocational training

☒ EQF 4

Secondary vocational diploma

☒ EQF 5

Higher technical diploma

☒ EQF 6+

Higher education



AUTOMOTIVE

Automotive Engine
3- or 4-cylinder
Common-rail or
petrol injection



Ref.: SYS-MSB.D
SYS-MSB.E

Photos are not contractually binding

The engine on the test bench features new technology and enables the manufacturer to comply with current standards.

Two versions are available: Diesel (ref. SYS-MSB.D) or Petrol (ref. SYS-MSB.E).

It is fitted with an injection system. The diesel version features a common-rail system combined with a urea injection system and a catalytic converter.

This modern assembly therefore enables users to explore, in addition to the injection system, a wide range of areas relating to engine operation (charging system, starting system, supercharging, cooling, lubrication, timing, etc.).

THE INSTALLATION PERFECTLY MATCHES THE VEHICLE'S ARCHITECTURE.

PRESENTATION

The bench consists of:

An engine:

- Electrical system: battery, fuses, relays, BSI or UCH, key switch
- Turbocharging (turbocharger + intercooler + EGR, if equipped)
- Starting system
- Cooling system with radiator and expansion tank
- Control modules: engine, instrument cluster, AdBlue (if equipped) (for the diesel version)
- Accelerator pedal
- Fuel pump
- AdBlue tank (for the diesel version)
- OBD2 diagnostic port



BENCH-MOUNTED RUNNING ENGINE

A dashboard equipped with the control units necessary for the CAN network to function:

- The entire assembly is mounted using genuine rubber mounts on a mechanically welded frame coated with a durable epoxy-type paint.
- The engine control unit is accessible without disassembly and in accordance with the vehicle's layout; it is equipped with a splitter harness connected to a compact, versatile measurement terminal block. This terminal block is supplied and equipped with a minimum of 252 channels from the ONE TOO brand (1 per test bench), with custom masks for each harness.
- A tablet measuring $L = 450 \text{ mm} \times W = 340 \text{ mm}$ (maximum) is attached to the chassis to hold the terminal block and facilitate electrical connections and measurements from the various sensors, pre-actuators, and actuators.
- A brand-specific or multi-brand diagnostic tool is compatible with the ECUs.
- An electronic battery maintenance charger is included.

Security features:

- a removable liquid containment tray,
- a battery disconnect switch, an emergency stop switch, and a start switch,
- a protective assembly for rotating parts, hot parts, and batteries (Rotating Machinery Directive).

DOCUMENTATION PROVIDED ON A USB DRIVE.

TRAINING ACTIVITIES

Upon completion of the course activities, students will be able to:

- identify the various components of an internal combustion engine,
- describe and analyze engine operation (valve train),
- identify, describe, and analyze the air system (supercharging),
- identify, describe, and analyze the exhaust system (supercharging and brake),
- identify, describe, and analyze the operation of the fuel injection system and the emissions control system for diesel engines,
- identify, describe, and analyze the operation of the charging, starting, cooling, and lubrication systems,
- identify and analyze the engine's electronic architecture and the communication between the various control modules,
- use diagnostic tools: display unit and diagnostic tool,
- read and interpret electrical diagrams,
- take measurements on various sensors and actuators and analyze their operating principles and control methods,
- diagnose the various engine systems, particularly the fuel injection system.

The workbench comes with comprehensive documentation that enables instructors to quickly implement the various hands-on exercises provided. It offers a wide range of educational applications.

This workbench can be used from vocational training through higher education.

The design provides unparalleled accessibility and visibility.

BENCH-MOUNTED RUNNING ENGINE

CHARACTERISTICS

Dimensions:

L = 1200 D = 1100 H = 1400 mm

Weight:

550 kg

☒ EQF 3

Vocational training

☒ EQF 4

Secondary vocational diploma

☒ EQF 5

Higher technical diploma

☒ EQF 6+

Higher education

AUTOMOTIVE





Ref.: SYS-MANUT.EXU

This training model promotes to learn electronic forklift truck EXU functions. The Product is intended for maintenance engines program schools. Also it's suitable for program « functional and structural analyses » (kinematics, elements and car moving speed, power, transmission report , brake features, set-up normalized) and «technology and handling operations » (identification real components, analogue signals, controlling organs, order analysis, research and diagnosis CAN network).

THIS DIDACTIC STAND (SIMULATOR + TRAINING DOCUMENTATIONS) ASSOCIATED WITH A HANDLING REAL SYSTEM IS DERIVED FROM PARTNERSHIP BETWEEN STILL AND DIDAC BDH (A FIRST IN FRANCE).

PRESENTATION

The model is composed of:

- An operational electronic forklift truck STILL (without the forks).
- A frame (L x l x h : 1370 x 710 x 1570 mm) with wheels (swivel / lockable).
- Control and measuring equipment (internally measures electronic card in chassis and connecting with PC by USB card, current sensors, power, position and pressure).
- Driving wheel resistant torque device start by pedal gear.
- Multipoint connector integrated with measurement channels.
- Integrated and lockable failure simulation box.
- PC (unité centrale dans la partie inférieure du châssis verrouillée à l'aide d'une porte munie de serrure, écran Leds full HD, clavier et souris).
- Two batteries 12V and a built-in smart charger.

ELECTRIC PALLET TRUCK - EXU

- a DIDAC BDH software for controlling images from the simulator:
 - a resources section: manufacturer's technical and sales documentation.
 - a supplementary section: kinematic analysis (connections and diagrams).
 - an analysis section (real-time on-screen animation of drawings and measurement taking): Analysis of the trolley's lifting and movement.
 - a Technology section (real-time on-screen animation of drawings and measurement taking): Analysis of the trolley's lifting and movement: control signals, sensors, pre-actuators, and actuators.

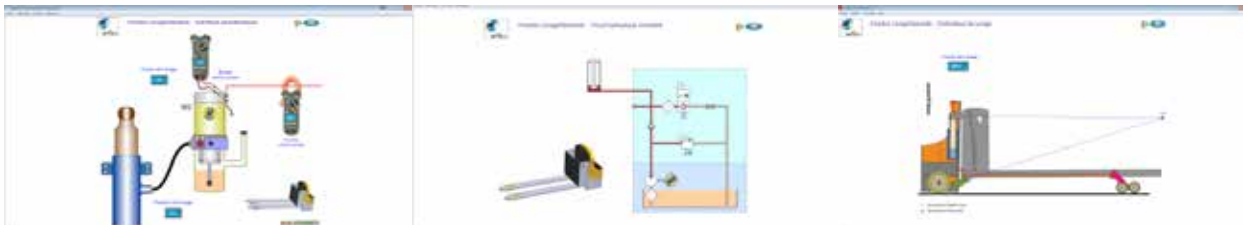
LEARNING OBJECTIVES

This didactical model promotes to acquire the following skills:

In the functional and structural analysis field:

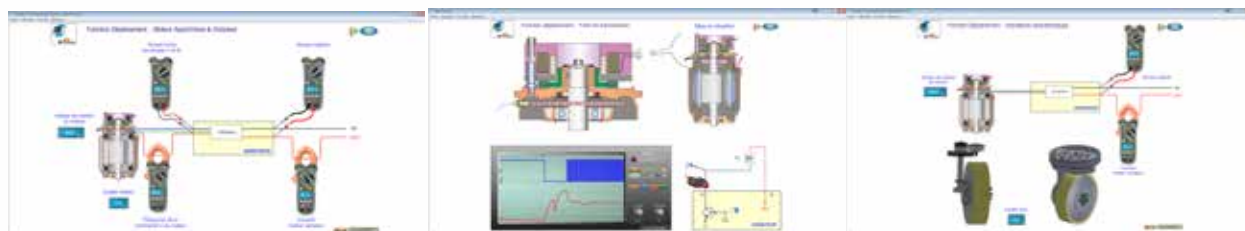
TRAINING TO LIFT OPERATION

SKILLS	Vocational training	Higher
To identify the different kinematic links.	X	X
To realize all or part of kinematic schema.	X	X
To determine the elements moving speed of hoist system through the diagram.		X
To set a link lifted load / pressure in hydraulic system (all or a part)	X	X
To identify the different components of hydraulic system and define their role.	X	X
To realize all or a part of standardized hydraulic schema.	X	X
To identify and to quantify the different powers concerned in the lifting system.		X



DISPLACEMENT TROLLEY TRAINING

SKILLS	Vocational training	Higher
To identify the motion transmission between the engine AC and the driving wheel.	X	X
To check the trolley travel rate (transmission ratio).	X	X
To identify and calculate the powers concerned (couple /output).		X
To analyze the brake operation and the adjustment of the air-gap.	X	X
To check the brake mechanical characteristics.		X



In the technology and interventions field:

TRAINING TO LIFT OPERATION

SKILLS	Vocational training	Higher
To identify the various components related to hoisting (order, treatment, relay, actuators).	X	X
To analyze the tensions on the level of the order switches and the limit switch.	X	X
To supplement the hydraulic schema in the rise and descent phases.	X	X
To control the components (resistance, tension, current).	X	X
To search a breakdown.	X	X



ELECTRIC PALLET TRUCK - EXU

DISPLACEMENT TROLLEY TRAINING

SKILLS	Vocational training	Higher
To identify the various components related to displacement (order, treatment, relay, actuators).	X	X
To analyze the tensions on the level of the double potentiometers of order (pot. of traction and tiller).	X	X
To analyze the role and the action of the anti-crashing safety.	X	X
To analyze the speed sensor signals (speed and direction of rotation).	X	X
To analyze the engine control in function : - speed (variable frequency) - resistive torque (current variable) (Inverter).		X
To analyze the service brake control (PWM).	X	X
To search a breakdown.	X	X



DIALOGUE VARIATOR / COMBINED INDICATOR / DIAGNOSTIC TOOLS TRAINING

SKILLS	Vocational training	Higher
Study of the dialogue variator / handset indicator /diagnostic tools	X	X
To identify the network CAN and resistances of termination.	X	X
To control the network (resistance, tension, on the wires CAN H and CAN L).	X	X
To analyze a frame.		X

TRAINING ACTIVITIES

IDEAL LINK BETWEEN REAL SYSTEM AND DIGITAL MODEL.

Several means are available to carry out these activities:

- Animations in real time.
- Measurements using the software, directly on the transpallet or the connector block.
- Digital modelling is provided.
- Components identification.
- System analysis.
- Diagnosis:
 - Breakdowns realization using the special “box breakdowns”:
 - Symptoms the user’s/technician’s view point → identification of the impact on the system performances.
 - Analysis of the dysfunction by the software.

The real system associate with measurements and high qualities animations (quality of the images and technological rigor), allow a very complete exploitation of the simulator.

A trainers kit (file resources, file of use, Practical works: Trainer/student) is very complete and provided with the simulator on USB key.

CHARACTERISTICS

Power:
Electric 220 V 50 Hz

Dimensions:
L = 1370 D = 710 H = 1570 mm

Weight:
450 kg

OPTION

- Protective cover

☐ EQF 3

Vocational training

☒ EQF 4

Secondary vocational diploma

☒ EQF 5

Higher technical diploma

☒ EQF 6+

Higher education

**MATERIAL HANDLING
EQUIPEMENT**



ELECTRONICALLY CONTROLLED REAR AXLE STEERING (RAS-EC)



Ref.: SYS-RASEC

Benefits of studying the RASEC system:

- A modern control system that is highly representative of in-vehicle electronic systems: conventional and specialized sensors, actuators, J1939 and J1587 networks, etc.
- A system that incorporates hydraulic components.
- A closed-loop system.

AN ONBOARD ELECTRONIC SYSTEM POWERED BY HYDRAULIC ENERGY, FULLY CONFIGURED FOR EDUCATIONAL PURPOSES, AND FEATURING A PROFESSIONAL DIAGNOSTIC TOOL.

PRESENTATION

- A complete, self-contained system mounted on a mobile chassis.
- All of the actual RASEC components are present.
- The model is fully equipped for a comprehensive study:
 - Driver's console with vehicle speed display, operational indicator lights, and multifunction display,
 - Terminal block for measurements associated with the ECU channels,
 - Fault simulation box,
 - Integrated JALTEST V.I. multi-brand diagnostic tool,
 - Data acquisition system with integrated instrumentation (pressure sensors, displacement sensors, etc.)
 - PC with measurement cards and educational software featuring REAL-TIME control of 2D and 3D images.



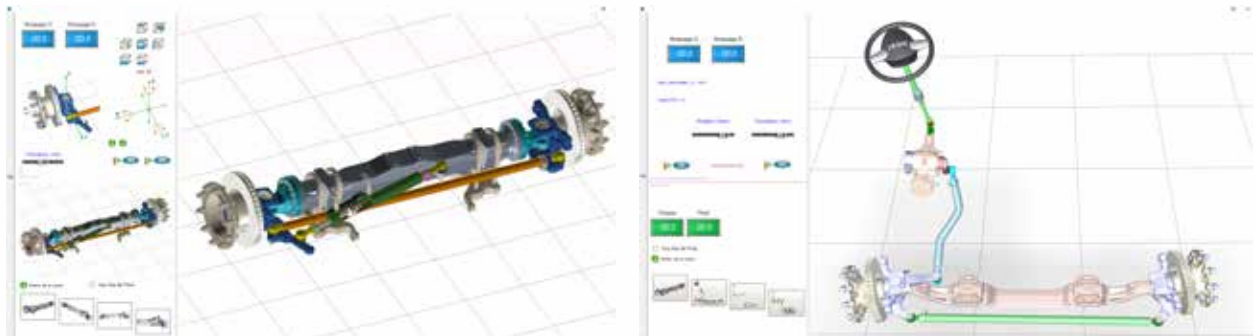
ELECTRONICALLY CONTROLLED REAR AXLE STEERING (RAS-EC)

LEARNING OBJECTIVES

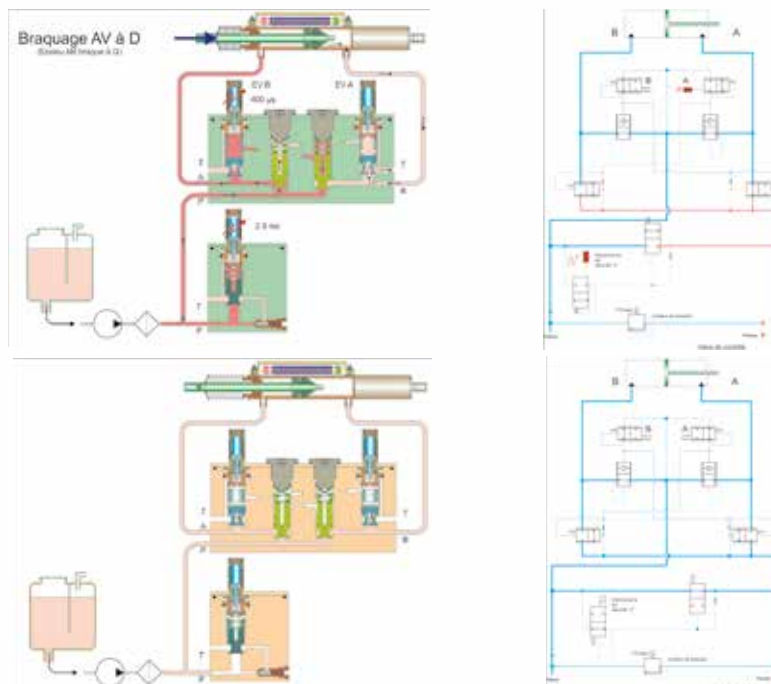
This simulator is particularly effective at helping users develop the following skills:

In the field of functional and structural analysis:

- Identify the components and the various kinematic links of the rear axle.



- Draw all or part of the kinematic diagram.
- Determine the turning radii with and without RASEC (bicycle model and the effect of tire slippage on the ground).
- Establish the relationship between the cylinder's displacement and the rear wheels' steering angle.
- Graphically determine the velocities of the components of the rear steering system.
- Identify the various components of the hydraulic circuit and define their roles.
- Analyze the hydraulic diagrams in the following phases:
 - Straight line
 - Turn right
 - Turn left



THIS MODEL ALLOWS YOU TO PERFORM REAR-AXLE ALIGNMENT USING THE BUILT-IN JALTEST VEHICLE DIAGNOSTIC TOOL AND THE WHEEL ALIGNMENT MENU IN THE OPERATING SOFTWARE.

In the field of technology and interventions:

- Identify the various components of the system (control, processing, actuators).
- Analyze the operation of the various sensors:
 - Steering wheel angle on steering gearbox (dual-track potentiometer).
 - Actuator displacement (differential transformer sensor).
- Analyze the control method for the solenoid valves:
 - Safety solenoid valve: hold-open.
 - Solenoid valves A and B (steering right and left): PWM.
- Identify the various components involved in the communication between the RASEC control unit and the other ECUs (Engine, EBS, suspension, IC05, and Tacho).
- Identify the CAN network and the termination resistors.
- Adjust the rear axle alignment and calibrate the axle (alignment bench mode).
- Troubleshoot an electrical fault. Check the components (resistance, voltage, current).
- Check the network (resistance, voltages on the CAN H and CAN L wires).
- Analyze the axle's operation in degraded mode (role of the dampers) and the reverse-drive lockout (induced steering).

CHARACTERISTICS

Power:
Electric 220 V 50 Hz

Dimensions:
L = 1 300 D = 700 H = 1 700 mm

Weight:
250 kg

OPTIONS

- Protective cover
- Picoscope 4425A - Automotive Series



☐ EQF 3

Vocational training

☒ EQF 4

Secondary vocational diploma

☒ EQF 5

Higher technical diploma

☒ EQF 6+

Higher education

TRUCKS



FAULT SIMULATION AND MEASUREMENT BREAKOUT BOX



60-CHANNEL

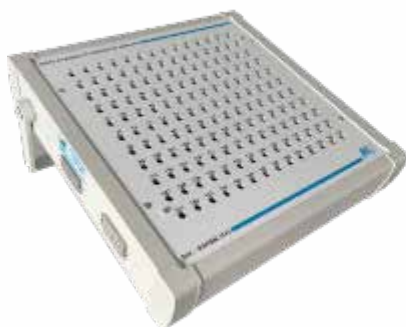


124-CHANNEL

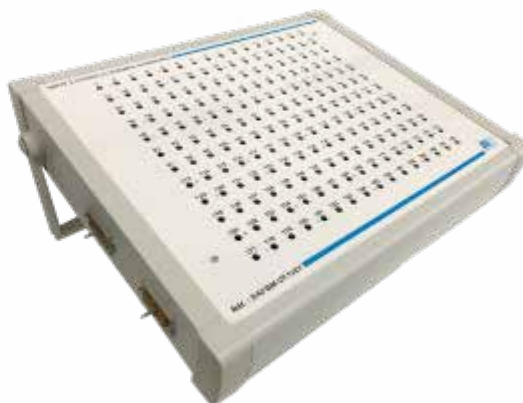


Ref.: BAPBM

154-CHANNEL



192-CHANNEL



THE IDEAL AND PRACTICAL SOLUTION FOR PERFORMING MEASUREMENTS AND FAULT SIMULATION AT THE INPUT AND OUTPUT PINS OF THE ECUS WHILE PRESERVING THE VEHICLE'S WIRING HARNESS!

The wiring harnesses remain permanently connected to the vehicle:

- No more connector issues caused by repeated connections and disconnections.
- When the training activities are complete, the control unit is disconnected from the vehicle, and the male and female wiring harness connectors on the box side are connected to each other to restore the vehicle's integrity, allowing it to be moved easily.
- No additional plug is needed in the wiring harness to complete the circuit if the box is disconnected: this reduces the number of components, storage requirements, and the risk of loss or theft.

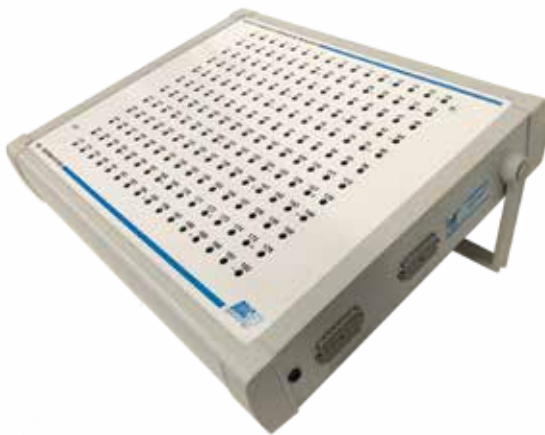
The only fault simulation box on the market that allows faults to be cleared while keeping the wiring on the front panel. The instructor will work through the rear door, and the student will be able to verify that the repair has been completed by taking a measurement as quickly as possible.

FAULT SIMULATION AND MEASUREMENT BREAKOUT BOX

PRESENTATION

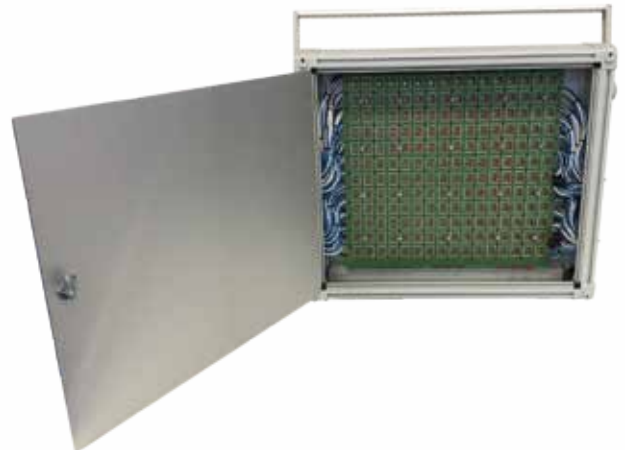
A sturdy aluminum tabletop enclosure equipped with male and female connectors:

The fixed front panel incorporates the sockets and the external covers corresponding to the control unit.



The branch cables will be connected to the enclosure using male/female industrial connectors located on the left and right sides. These connectors are designed for regular use, unlike the manufacturer's connectors.

The bottom of the case is equipped with a door featuring a built-in lock (2 keys included), allowing access to the panels.



Each channel is protected by internal fuses. For each channel, we can simulate an open circuit, a short to ground, and a line resistance using two wires and mini alligator clips.

A fuse tester is included with the fault simulation box.



A compact box for safely organizing and storing all your accessories.

This educational resource covers levels from vocational training to higher education.

60-CHANNEL FAULT SIMULATION AND MEASUREMENT BREAKOUT BOX

Ideal for motorcycles (fuel injection, braking, and more...).

This versatile 60-channel box comes with the desired wiring harnesses and exterior/interior templates to help you easily identify the terminals for each ECU.

Ref.: BAPBM.60V



124-CHANNEL FAULT SIMULATION AND MEASUREMENT BREAKOUT BOX

Designed for the ECUs of RENAULT TRUCKS, VOLVO TRUCKS, VOLVO CONSTRUCTION EQUIPMENT, and VOLVO PENTA, it comes with two 62-channel harnesses, A and B.

All 124 channels are pre-wired, ensuring 100% compatibility with all engine applications and variants from the AB Volvo Group.

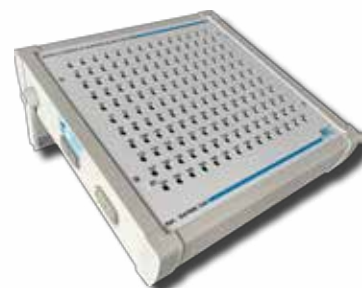
Ref.: BAPBM-RTVT.124V



154-CHANNEL FAULT SIMULATION AND MEASUREMENT BREAKOUT BOX

A versatile 154-channel box that comes with the desired wiring harnesses and external/internal templates to easily identify the terminals for each ECU.

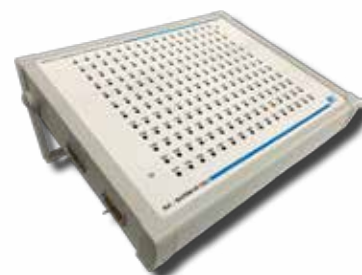
Ref.: BAPBM.154V



192-CHANNEL FAULT SIMULATION AND MEASUREMENT BREAKOUT BOX

A versatile 192-channel box that comes with the desired wiring harnesses and external/internal templates to easily identify the terminals for each ECU.

Ref.: BAPBM-VP.192V



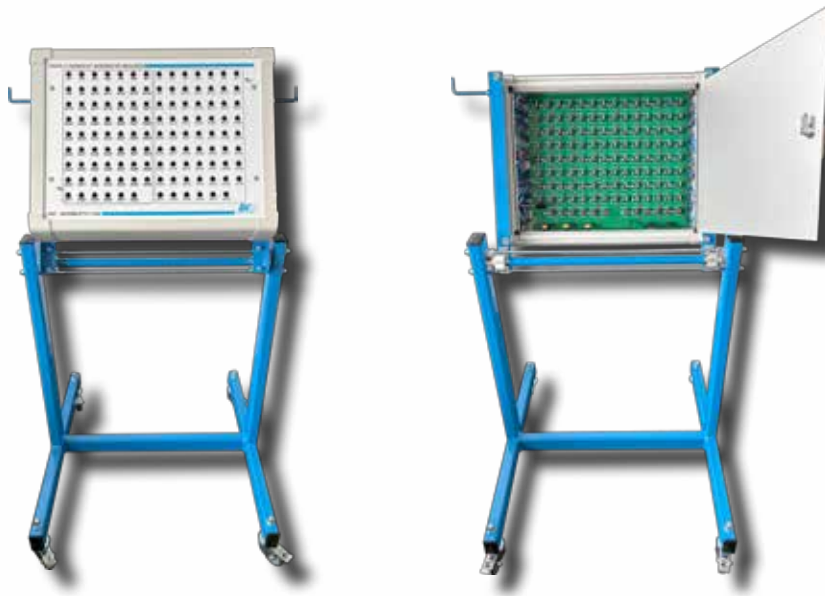
✓ DIDAC BDH can manufacture custom wiring harnesses on demand, based on photos and the pinout of the ECU's male/female connectors.

FAULT SIMULATION AND MEASUREMENT BREAKOUT BOX

OPTIONS

MOBILE CART FOR FAULT SIMULATION AND MEASUREMENT BREAKOUT BOX

Ref.:
ACC-CH.124V
ACC-CH.192V

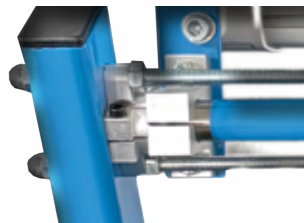


Designed as an accessory for DIDAC fault simulation and measurement breakout boxes, this cart allows you to easily move your box and ensures a comfortable working height for the user.

The box is mounted on a tilting frame that allows it to be set in two positions:

- Working position: The BAPBM is tilted at a 45° angle, providing a clear view and easy access to all measurement channels. The height of the BAPBM is equivalent to that of a terminal block placed on a 700 mm-high desk.
- Troubleshooting position: The BAPBM is tilted vertically to allow the rear door to be opened.

The rotation axis and stops are supported by robust industrial bearings, which optimize the product's service life.



Both positions are stable, and there is no need to disconnect the measurement cables or harnesses connected to the BAPBM to switch from one position to the other.

The cart is made of epoxy-coated steel, ensuring robustness and increased durability. It is equipped with four swivel casters with brakes, which allow for easy movement and stability during operation.

The swivel arms are equipped with hooks that support the cables and limit the tension caused by the cables' weight in order to protect the connectors.

CHARACTERISTICS

	<u>Dimensions:</u>	<u>Weight:</u>
BAPBM.60V	L = 378 D = 278 H = 100 mm	7 kg
BAPBM-RTVT.124V	L = 478 D = 378 H = 100 mm	10 kg
BAPBM.154V	L = 478 D = 478 H = 100 mm	12 kg
BAPBM-VP.192V	L = 578 D = 478 H = 100 mm	13.5 kg
ACC-CH.124V ACC-CH.192V	L = 750 D = 600 H = 900 mm	15 kg

☒ EQF 3 Vocational training
 ☒ EQF 4 Secondary vocational diploma
 ☒ EQF 5 Higher technical diploma
 ☒ EQF 6+ Higher education

AUTOMOTIVE

TRUCKS

AGRICULTURAL
MACHINERY

MOTORCYCLE

CONSTRUCTION

MATERIAL HANDLING
EQUIPEMENT



252-CHANNEL MEASUREMENT TERMINAL BOX



one  too

Ref.: BM-252V

*DIDAC BDH BECOMES THE EXCLUSIVE
DISTRIBUTOR OF ONE TOO IN FRANCE
FOR SCHOOLS*

A COMPACT AND VERSATILE SOLUTION THAT ENSURES REPEATABLE ELECTRICAL MEASUREMENTS WITHOUT RISK OF DAMAGE TO THE MANUFACTURER'S WIRING HARNESSES OR CONNECTORS.

Universal terminal box with up to 252 channels, designed to detect problems in a vehicle's electrical system. The One-Too Connect terminal box connects between the ECU and the vehicle's wiring harnesses to monitor electrical values and signals.

ADVANTAGES :

- Improved signal quality
- Eliminates the need to look up wire numbers
- Reduces handling errors
- Saves time
- Developed in collaboration with the automotive manufacturer's repair procedures

PRESENTATION

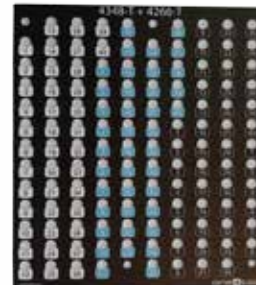
Y-splitter harnesses equipped with 63-channel industrial screw-on connectors for the case and manufacturer-specific male/female connectors.



252-CHANNEL MEASUREMENT TERMINAL BOX

After connecting to the ECU via the terminal block, the signal tap harness enables the measurement of electrical signals via a tap: Euro 6, ABS, passenger compartment, etc. Since each type of car has different connectors, One-Too develops custom signal tap harnesses based on the automaker's repair procedures.

ACCESSORIES: FOR EACH HARNESS SOLD, A CUSTOM LABEL WILL BE PROVIDED TO EASILY IDENTIFY THE CONNECTOR PINS.



Upon request, we can produce a custom wiring harness. We will ask you in advance for photos of the male and female connectors.

CHARACTERISTICS

Dimensions:

L = 390 D = 340 H = 70 mm

Weight:

3 kg

☒ EQF 3

Vocational training

☒ EQF 4

Secondary vocational diploma

☒ EQF 5

Higher technical diploma

☒ EQF 6+

Higher education

AUTOMOTIVE

TRUCKS

AGRICULTURAL
MACHINERY

MOTORCYCLE

CONSTRUCTION

MATERIAL HANDLING
EQUIPEMENT



MECHANICAL DIAGNOSTICS DV ENGINE



Ref.: DIAG-MECA.MDV

**A REAL ENGINE + EDUCATIONAL SOFTWARE = THE IDEAL LINK
BETWEEN THE REAL SYSTEM AND THE DIGITAL MODEL.**

✓ Product complies with French national education standards

✓ Fully instrumented real engine with built-in mechanical faults:

- Compression tester
- Leak detector
- Encoders: Crankshaft / Camshaft

✓ This educational resource promotes interdisciplinary learning:

- MATHEMATICS
- SCIENCE
- FUNCTIONAL SYSTEMS ANALYSIS
- MAINTENANCE

✓ Engine kit includes:

- PC / Keyboard / Mouse
- High-quality 16:9 monitor
- Battery + trickle charger
- Specialized tools:
 - Ratchet + socket
 - Spacer pins

✓ Educational activities organised around areas of interest:

- Vehicle Knowledge
- Scheduled Maintenance
- Measurements and Inspections
- Diagnostics

✓ From system discovery to diagnosis, with an emphasis on measurement

✓ 3D digital model provided

✓ Practical exercises provided and tailored to training levels

✓ All-inclusive service, including delivery, installation, and training



MECHANICAL DIAGNOSTICS DV ENGINE

DV ENGINE:

Functional, Safe, starter-driven

Permanent mechanical failures:

- Piston ring failure
- Bent intake valve
- Bent connecting rod



Computer equipment:

- Fully equipped PC
- Software installed and developed by DIDAC BDH
- High-quality 16:9 monitor



Specialized tools stored in the lower compartment (locked):

- Ratchet and socket set for manual engine cranking
- Crankshaft and camshaft setting pins

Integrated measuring tools:

- Leak detector
- Compression tester with quick-connect fittings installed in place of the glow plugs.



12 V battery:

- Smart charger integrated into the lower section

MODEL COMES WITH A 1-YEAR WARRANTY; WE HANDLE DELIVERY AND INSTALLATION.

This simulator is specifically designed to help students develop the skills outlined in the Vocational Diploma in Vehicle Maintenance curriculum:

- C.1.2: Communicate internally and with third parties,
- C.2.2: Diagnose a mechanical malfunction,
- C.3.2: Take measurements on a vehicle,
- C.3.3: Perform inspections and tests.

LEARNING OBJECTIVES

AREAS OF FOCUS	TOPICS COVERED OR PROFESSIONAL ACTIVITIES
C.I.1.	- Engine structure: - Connecting rod mechanism / timing system / crankshaft-connecting rod system / TDC position, - Timing diagram, - Timing alignment, - Valve lift + hydraulic lifters.
C.I.2.	Removal and installation of the belt and timing adjustment.
C.I.5.	- Compression test, - Leak analysis.
C.I.6.	Identification of faulty components.

CHARACTERISTICS

Power:
Electric 220 V 50 Hz

Dimensions:
L = 700 D = 660 H = 1700 mm

Weight:
250 kg

☒ EQF 3
Vocational training

☒ EQF 4
Secondary vocational diploma

☒ EQF 5
Higher technical diploma

☒ EQF 6+
Higher education

AUTOMOTIVE

TRUCKS

**AGRICULTURAL
MACHINERY**

CONSTRUCTION

**MATERIAL HANDLING
EQUIPEMENT**



MECHANICAL DIAGNOSTICS BRAKE CALIPER



Ref.: DIAG-MECA.EF

A REAL DISC BRAKE SYSTEM + EDUCATIONAL SOFTWARE = THE IDEAL LINK BETWEEN THE REAL SYSTEM AND THE DIGITAL MODEL.

- ✓ **Product complies with French national education standards**

- ✓ **This educational resource promotes interdisciplinary learning:**

- MATHEMATICS
- SCIENCE
- FONCTIONAL SYSTEMS ANALYSIS
- MAINTENANCE

- ✓ **Educational activities organised around areas of interest:**

- Vehicle Knowledge
- Scheduled Maintenance
- Measurements and Inspections
- Diagnostics

- ✓ **3D digital model provided**

- ✓ **Instrumented disc brake system:**

- Pressure sensor
- Force sensor
- Encoder (disk rotation)

- ✓ **Set includes:**

- PC / Keyboard / Mouse
- High-quality 16:9 monitor
- Specialized tools:
 - Ratchet + 27 mm socket + extension
 - 13 mm flathead screw-driver for replacing brake pads

- ✓ **From system discovery to diagnosis, with an emphasis on measurement**

- ✓ **Practical exercises provided and tailored to training levels**

- ✓ **All-inclusive service, including delivery, installation, and training**



MECHANICAL DIAGNOSTICS BRAKE CALIPER

Persistent mechanical failures:

- Worn brake pads
- Brake pads with reduced friction surface
- Greasy brake pads
- Seized caliper
- Seized piston

Computer equipment:

- Fully equipped PC
- Software installed and developed by DIDAC BDH
- High-quality 16:9 monitor

Specialized tools stored in the lower compartment (locked):

- Ratchet + 27 mm socket for manual rotation of the disc,
- 13 mm flat wrench.



Full-featured software organized by areas of interest

Discovery menu:

- Resources + 3D digital model

Measurements menu:

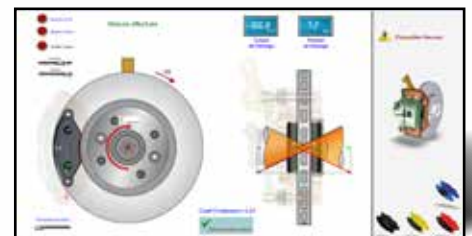
- Force, braking torque, disc rotation...

Diagnostics menu with road test:

- Simulation of a road test with a malfunction.

Brake test stand diagnostics menu:

- Simulation of a vehicle undergoing brake test stand testing with a malfunction.



MODEL COMES WITH A 1-YEAR WARRANTY; WE HANDLE DELIVERY AND INSTALLATION.

This simulator is specifically designed to help students develop the skills outlined in the Vocational Diploma in Vehicle Maintenance curriculum:

- C.1.2: Communicate internally and with third parties,
- C.2.2: Diagnose a mechanical malfunction,
- C.3.1: Bring systems, subassemblies, and components back into compliance,
- C.3.2: Take measurements on a vehicle,
- C.3.3: Perform inspections and tests.

LEARNING OBJECTIVES

AREAS OF FOCUS	TOPICS COVERED OR PROFESSIONAL ACTIVITIES
C.I.1.	Lab: Structure of the Disc Brake System (caliper, bracket, rotor)
C.I.3.	Lab: Removal and Installation of Brake Pads and Rotors
C.I.5.	Practical: Forces Involved (Brake Pressure Testing)
C.I.5. / C.I.6.	- Practical: Mechanical Diagnosis of Disc Brakes - Lab: Brake Test Stand
C.I.6.	Lab: Dynamic Behavior

CHARACTERISTICS

Power:
Electric 220 V 50 Hz

Dimensions:
L = 700 D = 660 H = 1700 mm

Weight:
85 kg

☒ EQF 3
Vocational training

☒ EQF 4
Secondary vocational diploma

☒ EQF 5
Higher technical diploma

☒ EQF 6+
Higher education

AUTOMOTIVE

TRUCKS

AGRICULTURAL
MACHINERY

CONSTRUCTION



MEASUREMENTS AND ANALYSIS AIR CONDITIONING RT



Ref.: MA-AC.RT

Measuring parameters directly on the vehicle allows for a rigorous approach under normal operating conditions. However, this approach is often limited by the need to communicate with multiple control modules at the same time, which diagnostic tools do not always support.

In this context, DIDAC BDH has developed a “MEASUREMENT AND ANALYSIS” kit that allows for the reading of a large number of parameters on the air conditioning system of Renault T models (T HIGH K and C).

PRESENTATION

This educational kit consists of: a “ruggedized” PC, educational software, and a measurement unit that connects to a (readily accessible) tap on the air conditioning control module, as well as temperature and pressure sensors. It should be noted that the measurement box also serves as a terminal block providing access to the control channels for the five stepper motors.



MEASUREMENTS AND ANALYSIS AIR CONDITIONING RT

How it works:

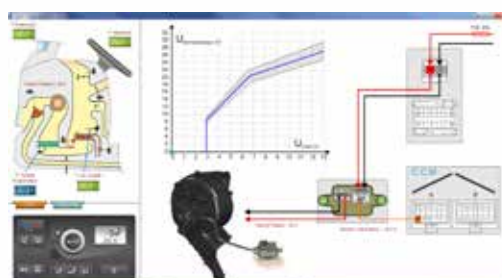
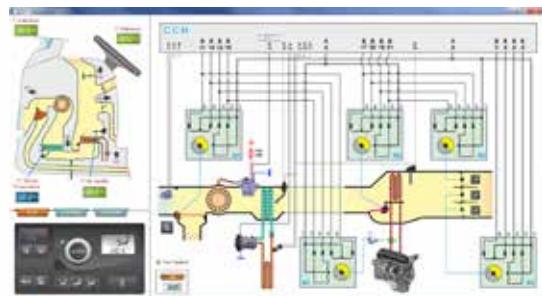
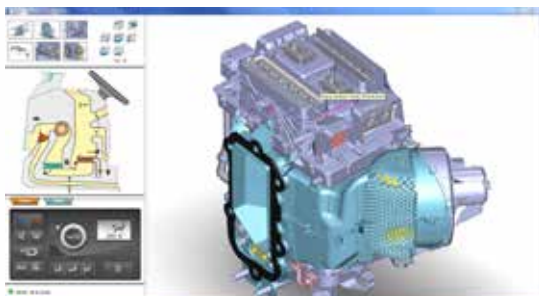
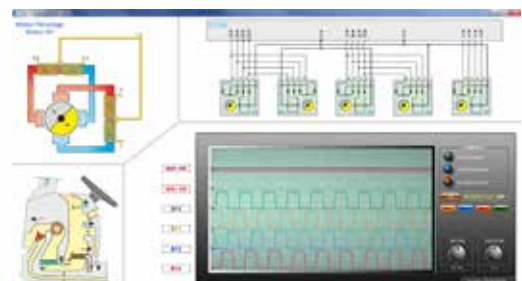
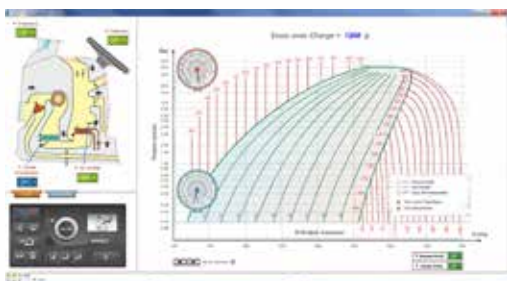
Upon delivery or setup, DIDAC BDH installs temperature sensors on the vehicle's refrigeration circuit and the branch harness.

During educational activities, all you need to do is connect the control unit to the branch harness and the sensors. The PC's USB port provides the connection to the measurement card built into the control unit.

TRAINING ACTIVITIES

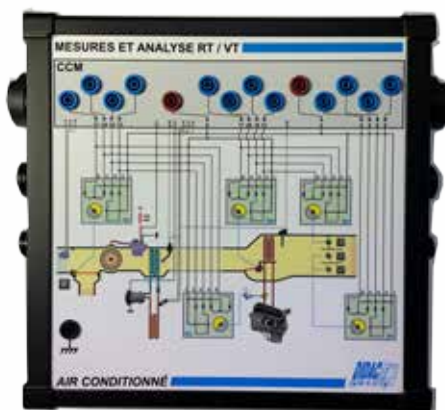
The software included with the PC reflects the care that DIDAC BDH puts into its products:

- Digital models of the complete heating unit and the cooling loop.
- Real-time control of animations (2D and 3D) based on measurements taken from the vehicle,
- Measurements with parameter logging,
- Analysis of measurements for the various functions of the air conditioning system (HVAC unit, motor control, blower control, refrigeration loop with enthalpy diagram plotting, etc.)



However, the design of the software associated with the terminal block mounted on the measurement unit also allows students to conduct measurements and the resulting analyses on their own. Thus, this system is also an ideal tool for technical projects.

In this context, the Car&Box measurement system and the Multigraphe Data Analysis software, with its powerful graphing tool, can be fully utilized.



CHARACTERISTICS

Power:

Electric USB

Dimensions:

L = 340 D = 290 H = 180 mm

Weight:

1,5 kg

☐ EQF 3

Vocational training

☒ EQF 4

Secondary vocational diploma

☒ EQF 5

Higher technical diploma

☒ EQF 6+

Higher education

TRUCKS





Recording data during braking tests in the workshop, on the brake tester, or even during a road test is an effective educational approach for developing skills in the field of braking.

That's exactly what DIDAC BDH offers with the Renault T Braking Measurement and Analysis Unit!

PRESENTATION

This educational kit consists of: a "ruggedized" PC, educational operating system software, and a measurement unit that connects to a tap on the vehicle's CAN bus.



MEASUREMENTS AND ANALYSIS

EBS 7 BRAKING RT/VT

How it works:

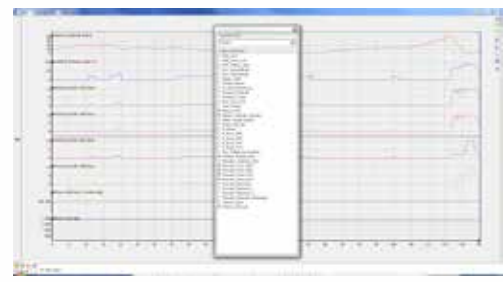
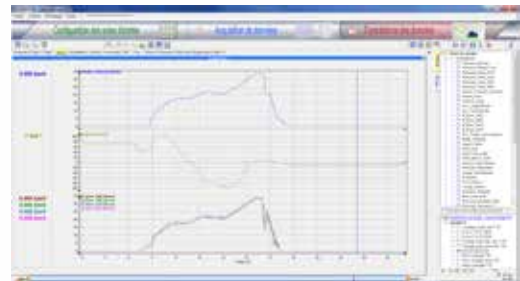
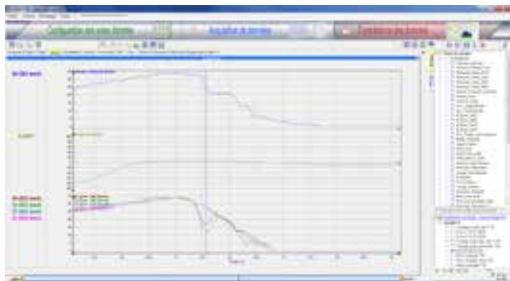
Upon delivery or initial setup, DIDAC BDH installs the splitter cable.

During educational activities, all you need to do is connect the unit to the splitter cable. The PC's USB port provides the connection to the measurement card built into the unit.

TRAINING ACTIVITIES

The software designed for the measurement unit also allows students to conduct measurements and the resulting analyses on their own. As a result, this system is also an ideal tool for technical projects.

In this context, the Car&Box measurement system and the Multigraphe Data Analysis software, with its powerful graphing tool, can be fully utilized.



CHARACTERISTICS

Power:

Electric USB and 24V outlet

Dimensions:

L = 250 D = 110 H = 40 mm

Weight:

0,470 kg

☐ EQF 3

Vocational training

☒ EQF 4

Secondary vocational diploma

☒ EQF 5

Higher technical diploma

☒ EQF 6+

Higher education

TRUCKS





Ref.: MA-TFBAC.ZOEPH1

** Vehicle not included; see terms and conditions*

In vehicle maintenance training programs, diagnostics play a particularly important role, and companies are keen to hire skilled technicians. As a result, the teaching staff takes great care to develop high-quality training in this area, notably through the extensive use of diagnostic tools (manufacturer-specific or multi-brand). A fundamental aspect of using diagnostic tools is reading the parameters. In fact, it is the interpretation of these parameters that provides the technician with the information needed to determine the cause of the malfunction. Vehicles equipped with new technologies are no exception to this rule. However, for certain vehicles, access to these parameters has been “locked” by manufacturers, and training teams are unable to provide the “high-level” training that is essential for technicians to fully understand and work on these technologies.

PRESENTATION

In this context, DIDAC BDH has developed a “MEASUREMENT AND ANALYSIS” kit that allows users to read a wide range of parameters from the systems installed in the RENAULT ZOÉ. This training kit consists of: a “ruggedized” PC, training software, and a measurement unit that connects to the ZOÉ’s diagnostic port.



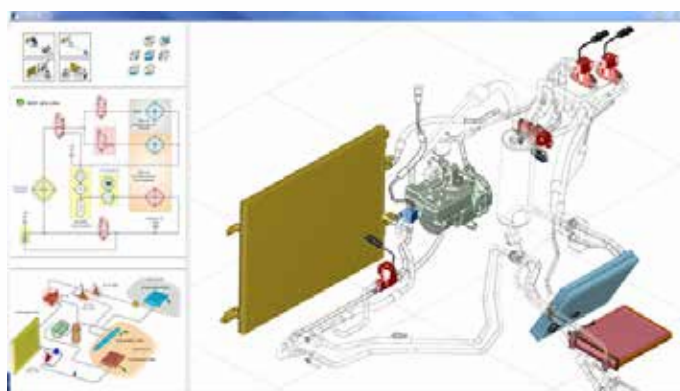
This kit allows you to read and interpret parameters related to the ZOÉ’s major functions, which are:

- Air conditioning (analysis of the heat pump and air conditioning system: comprehensive analysis of the heating unit, parameters related to the cabin and battery fluid loops).
- Propulsion and braking: from the battery to the wheels (energy management for propulsion and regenerative braking, vehicle dynamics, consumption/range, etc.).
- The battery and electrical systems: charging the traction battery, analysis of converters, 14V power supply, etc.).

MEASUREMENTS AND ANALYSIS: POWERTRAIN, BRAKING, BATTERY, AIR CONDITIONING – ZOE PHASE 1

The PC and the control unit can be used in the workshop as well as during road tests to analyze the performance of the drivetrain and braking systems, in particular, under real-world conditions (the use of a “ruggedized” PC ensures a high level of reliability during road tests). The accompanying educational software allows users to monitor parameters in real time and record them.

As part of the learning process, 2D/3D animations and schematic diagrams are driven by the measurements, helping students understand these new systems more easily. In technical projects, the measurements taken allow students to analyze the system in great detail. The evolution of parameters can be studied directly within the software, by exporting the measurements to a spreadsheet, or by utilizing the powerful graphing capabilities of our Multigraphe Data Analysis software.



The DIDAC BDH “Plus” Features:

The unit simply plugs into the diagnostic port. The PC is high-performance and designed for road testing.

It allows you to bypass access restrictions on diagnostic tools at training facilities (manufacturer-specific or multi-brand). Only parameters are measured; there is no risk of accidental reprogramming.

The vehicle can be used for electrical certification training (a ZOÉ is therefore a good choice: certification and various educational activities, plus it's the best-selling zero-emission vehicle).

We handle delivery and commissioning at the training facility.

It reads more parameters than the manufacturer's tool used in the A.V. network. In particular, it is capable of querying different control modules simultaneously: for example, when studying the drivetrain, it is necessary to simultaneously query the engine management control module (rotor torque, rotor speed), the decoupled braking control unit (braking torque, deceleration), and the battery control unit (battery current, battery voltage, SOC, etc.). No other diagnostic tool supports multi-control unit queries.

The educational activities are based on the software, which includes high-quality animations. Learning is effective.

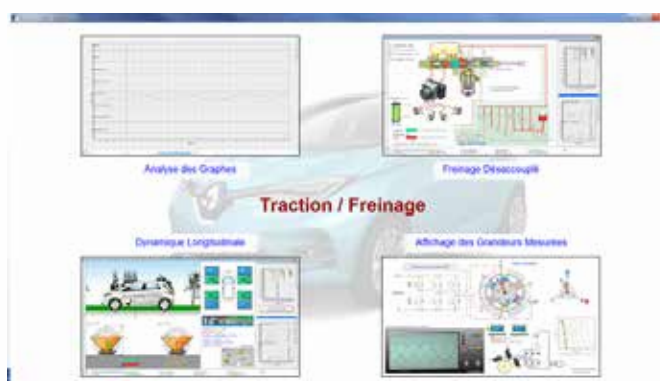
The kit is particularly well-suited for technical projects (data export via simple copy/paste). Fully compatible with the Car&Box and Multigraphe Data Analysis software.

As with all DIDAC BDH products, a resource folder on the ZOÉ, a software user guide, and practical exercises are provided (for students and teachers).

This simulator is particularly effective for developing the following skills:

In the field of functional and structural analysis:

- Identify the components and the various kinematic links of the steering system (from the steering wheel to the wheels).
- Draw all or part of the kinematic diagram of the front-wheel drive system.
- Establish the relationship between the rotation of the steering wheel, the movement of the rack, and the angle of the wheels.



Important note:

For institutions that do not have a ZOÉ, DIDAC BDH can assist with finding and supplying one. Please feel free to contact us.

CHARACTERISTICS

Power:

Electric USB

Dimensions:

L = 250 D = 130 H = 40 mm

Weight:

0,650 kg

☐ EQF 3

Vocational training

☒ EQF 4

Secondary vocational diploma

☒ EQF 5

Higher technical diploma

☒ EQF 6+

Higher education

AUTOMOTIVE



MEASUREMENTS AND ANALYSIS RENAULT E-TECH



Ref.: MA-R.E-TECH

The E-TECH technology found in many Renault vehicles is an ideal platform for studying hybrid vehicles.

Indeed, the E-TECH engine-transmission assembly features a wealth of technology and is therefore of great educational value.

As a result, DIDAC BDH has developed a comprehensive educational package that includes:
A Renault E-TECH vehicle, a data logger that connects to the diagnostic port, and a laptop equipped with measurement and data analysis software.

PRESENTATION



This training kit consists of:

- a “ruggedized” PC,
- training software,
- a measurement unit that connects to the vehicle’s diagnostic port.

This kit allows users to read and interpret parameters related to the **E-TECH function** as well as to **internal combustion engine management**.

MEASUREMENTS AND ANALYSIS

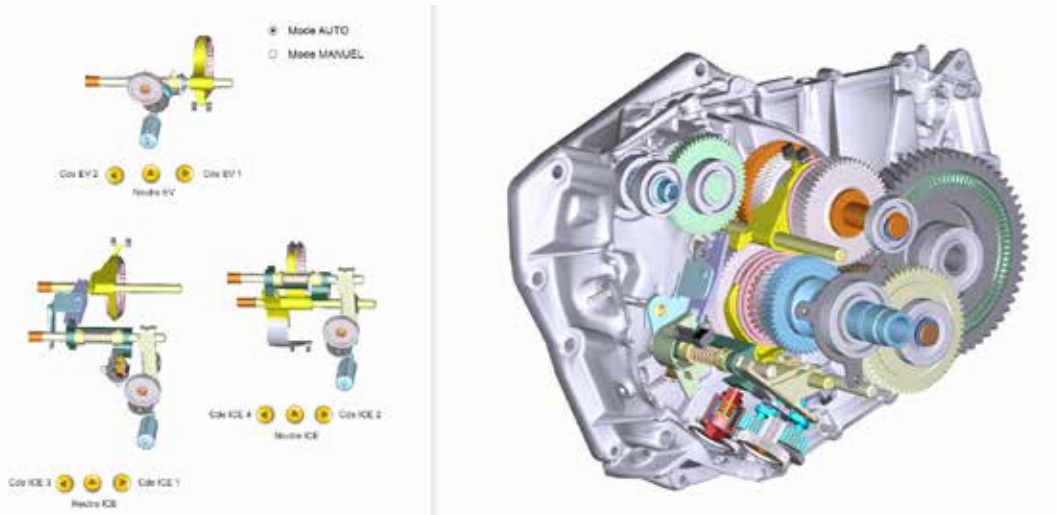
RENAULT E-TECH

TRAINING ACTIVITIES

The PC and the measurement unit can be used in the workshop as well as during road tests to analyze the system's operation and performance under real-world conditions (the use of a "rugged" PC ensures a high level of reliability during road tests).

The accompanying educational software allows users to monitor parameters in real time and, most importantly, to record them. As part of the learning process, 2D/3D animations and schematic diagrams are then driven by the measurements, enabling students to grasp these new systems more easily. In technical projects, the measurements taken allow students to analyze the system in great detail. The evolution of parameters can be studied directly within the software, by exporting the measurements to a spreadsheet, or by leveraging the power of DIDAC BDH's Multigraphe Data Analysis software.

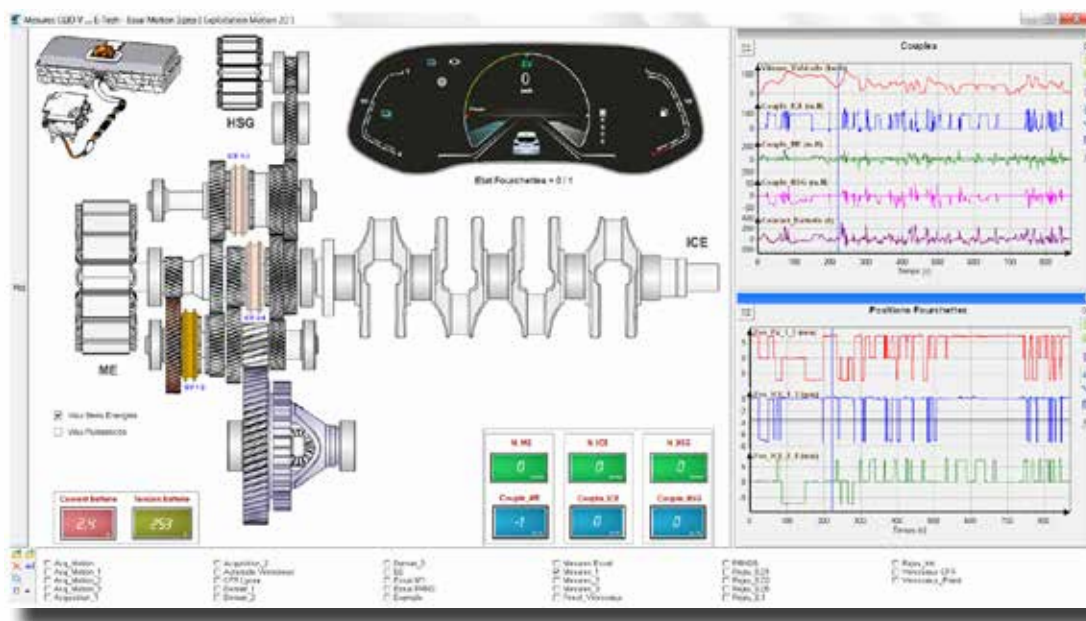
Study of the various gear ratio combinations (EV mode, ICE mode, and Hybrid mode)



Analysis of Fork Positions and Synchronization



Analysis of the forces involved



The DIDAC BDH “Plus” Features:

- ✓ The vehicle can be provided by DIDAC BDH.
- ✓ The unit simply plugs into the diagnostic port. The PC is high-performance and designed for road testing. It allows users to bypass access restrictions on diagnostic tools at training facilities (manufacturer-specific or multi-brand).
- ✓ The unit reads a wide range of parameters without having to “switch back and forth” between different ECUs.
- ✓ Educational activities are supported by software featuring high-quality animations. Learning is effective.
- ✓ The kit is particularly well-suited for technical projects (data export via simple copy/paste). Fully compatible with Car&Box and Exploitation de Données Multigraphe software.
- ✓ As with all DIDAC BDH products, a resource folder on the hybrid system, a software user guide, and practical exercises are provided (for students and teachers).
- ✓ The vehicle can be used as part of electrical certification training.
- ✓ We handle delivery and setup at the school.

CHARACTERISTICS

Power:

Electric USB

Dimensions:

L = 250 D = 130 H = 40 mm

Weight:

0,650 kg

☐ EQF 3

Vocational training

☒ EQF 4

Secondary vocational diploma

☒ EQF 5

Higher technical diploma

☒ EQF 6+

Higher education

AUTOMOTIVE



DIDAC BDH: DISTRIBUTOR



REF.: PICO-PQ179-DIDAC

PicoScope 4425A
Diesel Diagnostic Kit
4-channel
Supplied in a carrying case



REF.: PICO-PQ176-DIDAC

PicoScope BNC+ 4425A
4-Channel Starter Kit



REF.: PICO-PQ178-DIDAC

PicoScope 4425A
Standard Kit
4 channels
Supplied in a carrying case

PICOSCOPE



REF.: PICO-PQ268-DIDAC

**PicoScope 4425A NVH Essentials
Standard Kit**



REF.: PICO-PQ326-DIDAC

**Electric Motor and Milliohm Tester
Starter Kit**

☐ EQF 3

Vocational training

☒ EQF 4

Secondary vocational diploma

☒ EQF 5

Higher technical diploma

☒ EQF 6+

Higher education

AUTOMOTIVE

TRUCKS

AGRICULTURAL MACHINERY

MOTORCYCLE

CONSTRUCTION

**MATERIAL HANDLING
EQUIPEMENT**



JALTEST MULTI-BRAND DIAGNOSTIC TOOL



Ref.: OUT-DIAG.JAL



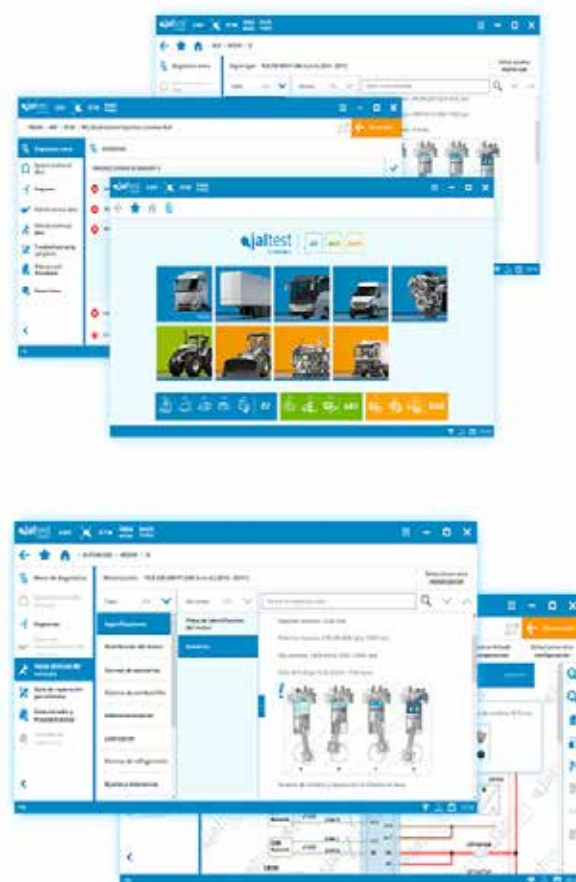
DIDAC BDH IS EXPANDING ITS LINE OF EDUCATIONAL MATERIALS WITH THE LAUNCH OF THE JALTEST MULTI-BRAND DIAGNOSTIC TOOL FOR TRAINING CENTERS.

JALTEST SOFT FEATURES: Jaltest provides all the information needed to quickly repair malfunctions.

1. Fault Reading
2. Additional Information on Malfunctions
3. Help with the Malfunction and Related Components
4. Component Information
5. Component Location
6. Interactive System Wiring Diagram
7. Step-by-Step Repair Guide
8. Repair Guide Details
9. Technical Notes for the Repair Guide

IN ADDITION TO THE INFORMATION STORED IN THE CONTROL UNIT, JALTEST PROVIDES A WEALTH OF SUPPLEMENTARY INFORMATION. IT'S MUCH MORE THAN JUST DIAGNOSTICS.

**DIDAC BDH: EXCLUSIVE
DISTRIBUTOR IN FRANCE
FOR SCHOOLS**



A USER-FRIENDLY AND POWERFUL TOOL OFFERING COMPREHENSIVE TECHNICAL DOCUMENTATION FOR THE LEADING VEHICLE BRANDS ON THE MARKET.

DIAGNOSTIC SOLUTIONS CAN BE CUSTOMIZED BASED ON THE VEHICLES IN YOUR SHOP.

JALTEST MULTI-BRAND DIAGNOSTIC TOOL



- Support for trucks, buses, trailers, light-duty vehicles, and pickup trucks.
- Supports all vehicle information protocols and standards, including RP1210 and Pass-Thru.
- Fast and intuitive software interface.
- Automatic detection of systems and error codes
- Symptom-based repair guide and error assistance.
- Integrated technical information, diagrams, technical bulletins...
- Scheduled updates and rapid implementation of new features (**offered free of charge to educational institutions**)
- Call center for technical and product support.
- Training available upon request.
- ETM - Electronic Test Module.
- i-Parts ASSIST. Parts cross-reference platform. Installation guides.
- GRP - Workshop Resource Planning Module.
- Vehicle brand customization.
- Repair times.





- Multi-brand and multi-system coverage for agricultural vehicles.
- Comprehensive diagnostics with detailed descriptions of error codes.
- Advanced diagnostic functions: Components, Calibrations,
- Settings...
- Automatic system detection.
- Integrated technical information and wiring diagrams.
- Scheduled update program (**offered free of charge to educational institutions**)
- Rapid integration of new market developments into our software.
- Fast, intuitive, and easy-to-use software interface.
- Call center for technical support.
- Training available upon request
- Grp—Workshop Management.

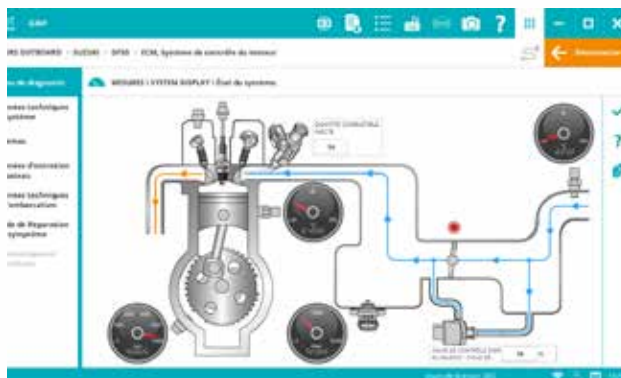


JALTEST MULTI-BRAND DIAGNOSTIC TOOL



- Multi-brand and multi-system coverage for Special Purpose Vehicles
- Comprehensive diagnostics with detailed descriptions of error codes
- Information on connector locations with helpful images
- Advanced diagnostic functions: Component status, Calibrations, Settings...
- Automatic system detection
- Integrated technical information and wiring diagrams
- Defined update schedule (**offered free of charge to educational institutions**)
- Rapid integration of new market developments into our software
- Fast, intuitive, and user-friendly software interface
- Call center for technical support and product assistance
- Training upon request
- GRP—Workshop Management





- Multi-brand and multi-system coverage for inboard, outboard, and jet ski engines
- Comprehensive diagnostics with detailed descriptions of error codes
- Advanced diagnostic functions: Calibrations, parameter settings, and key programming for jet skis
- Automatic system detection (Engine, Rudder Control, Steering Control, Propulsion System, Brakes and Reverse, Instrumentation, etc.)
- Integrated technical information and wiring diagrams
- Maintenance and service data
- Defined update schedule **(offered free of charge to educational institutions)**
- Rapid integration of new market developments into our software
- Fast, intuitive, and user-friendly software interface
- Call center for technical support and product assistance
- Training upon request
- GRP—Workshop Management



JALTEST MULTI-BRAND DIAGNOSTIC TOOL



☐ EQF 3

Vocational training

☒ EQF 4

Secondary vocational diploma

☒ EQF 5

Higher technical diploma

☒ EQF 6+

Higher education

TRUCKS

AGRICULTURAL
MACHINERY

MATERIAL HANDLING
EQUIPMENT

CONSTRUCTION



PDL 8200 MULTI-BRAND AUTOMOTIVE DIAGNOSTIC TOOL



Ref.: PDL-8200

**DIDAC BDH MARKETS THE SUN MULTIBRAND AUTOMOTIVE DIAGNOSTIC TOOL FOR TRAINING CENTERS.
DO IT ALL—FASTER—EASIER—GUARANTEED RESULTS.**

BE YOUR BEST EVERY DAY. WORK FASTER AND MORE SMOOTHLY, AND HANDLE MORE COMPLEX TASKS. STEP UP YOUR GAME AND TAKE IT TO THE NEXT LEVEL. THE PDL 8200 GIVES YOU THE POWER AND PERFORMANCE YOU'VE BEEN MISSING.

1. Starts up in 5 seconds: always ready
2. Access to codes/data in 30 seconds: optimizes your service time
3. Smart charging system: charges continuously while connected to the vehicle, always ready for use
4. Component tester: guides you in identifying a fault once the trouble code is known
5. Educational and highly efficient: tells you which components to test, where, how, and the reference values
6. Built-in training: detailed presentations showing how to identify...
7. Vehicle history: quickly switch between multiple jobs in progress
8. Code scan: perform a health check on each vehicle before you begin
9. High-speed 2-channel oscilloscope: access the latest vehicle models



DIDAC BDH: DISTRIBUTOR

MAIN CHARACTERISTICS

- 10-inch touchscreen + directional pad: intuitive—easy—fast
- Data cable with LED lighting (L = 2.8 m)
- Automatic vehicle identification
- “SCANNER” function: provides access to nearly 100% coverage of the passenger car fleet
- Guided component tests: guaranteed to identify even the most fleeting issues thanks to 1.5 million reference data points and comprehensive procedures
- TSB (Technical Service Bulletin) documentation: exclusive SUN resources based on experience and manufacturer data. A winning solution in every case to see the diagnosis through to the end.
- Services and support including a hotline, training, free online updates, and service contracts
Direct download of updates via Wi-Fi



PDL 8200 MULTI-BRAND AUTOMOTIVE DIAGNOSTIC TOOL

APPLICATIONS



Oscilloscope Mode



Diagnostic Mode



Multimeter Mode

THE ONLY EDUCATIONAL AUTOMOTIVE DIAGNOSTIC TOOL ON THE MARKET.

DATA ANALYSIS

The PDL 8200 diagnostic tool allows you to store and record vehicle data during a scan. Most of the necessary parameters are accessible, and a menu is available to select the data needed for the desired task.



These values are stored in a format specific to the manufacturer SUN, which is why we offer conversion software to extract and interpret the data in a graphing program.

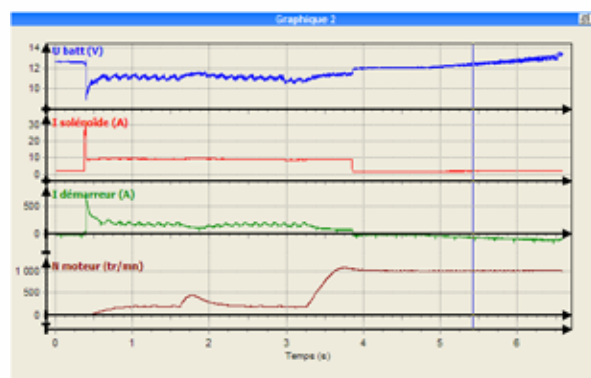
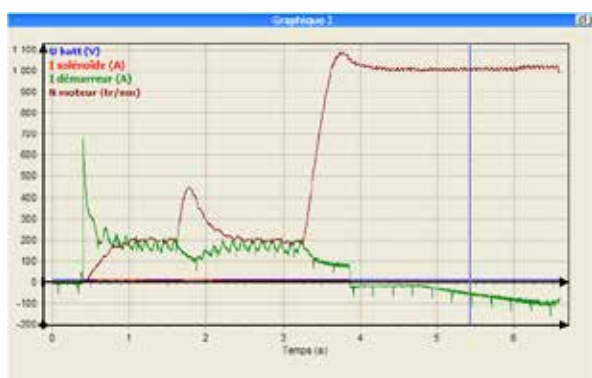
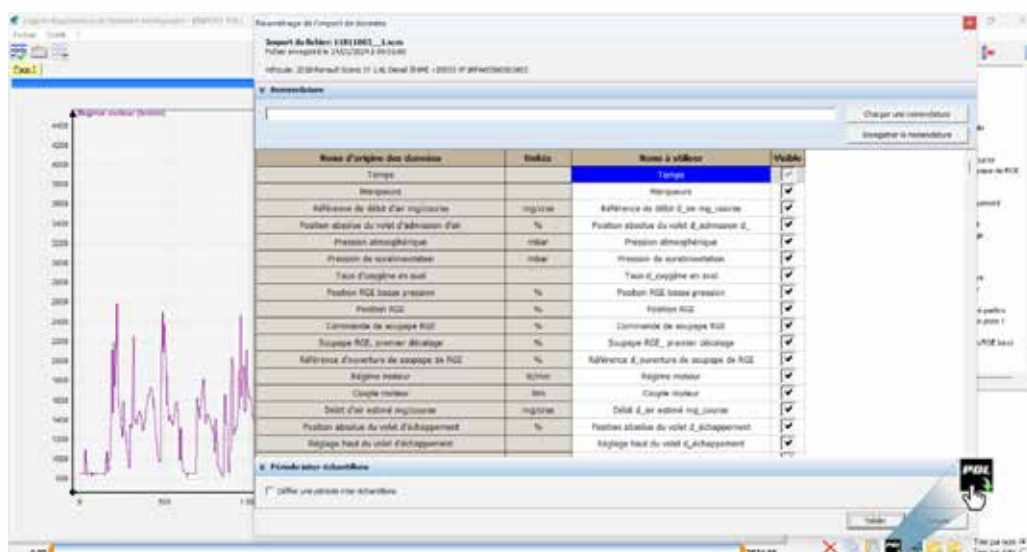
Convertisseur SCM - DIDAC BDH - V1.0.0.0

Temps	Marqueurs	MIL	REGIME MG2 (tr/min)	COUPLE MG2 (N-m)
0	0	0	844	58
1	0	0	2106	17
2	0	0	2130	16
3	0	0	2132	16
4	0	0	2149	18
5	0	0	2158	25
6	0	0	2169	30
7	0	0	2173	32
8	0	0	2205	73
9	0	0	2218	77
10	0	0	2223	49
11	0	0	2242	39
12	0	0	2264	44
13	0	0	2272	46
14	0	0	2294	47
15	0	0	2304	46
16	0	0	2324	46
17	0	0	2333	46
18	0	0	2333	46
19	0	0	2333	46
20	0	0	2333	46
21	0	0	2333	46
22	0	0	2429	41
23	0	0	2451	44
24	0	0	2461	47
25	0	0	2483	52

From .SCM

To Presse-papiers Excel

In particular, the data can be integrated into the Multigraphe Data Analysis software, which features a powerful scientific editor.



This software is available exclusively with the PDLs sold by DIDAC BDH.

PDL 8200 MULTI-BRAND AUTOMOTIVE DIAGNOSTIC TOOL

OPTIONS

- PDL 8200 Support Cart and Cable Management



☐ EQF 3
Vocational training

☒ EQF 4
Secondary vocational diploma

☒ EQF 5
Higher technical diploma

☒ EQF 6+
Higher education

AUTOMOTIVE

MOTORCYCLE



TENSTAR MULTI-MACHINE DRIVING SIMULATOR



Ref.: SDC-TST

**TENSTAR: THE MOST
POWERFUL AND REALISTIC
SIMULATOR ON THE MARKET.
IMMERSE YOUR MIND IN THE
EXPERIENCE.**

TENSTAR

simulation

Tenstar Simulation provides simulation-based training tools for schools, organizations, and companies that wish to train their staff to operate agricultural, construction, and transportation equipment in an environmentally friendly and cost-effective manner.



TENSTAR MULTI-MACHINE DRIVING SIMULATOR

WHY CHOOSE SIMULATION FOR TRAINING?

- OPTIMIZE TRAINING
- ENHANCE SAFETY
- MINIMIZE EMISSIONS
- REDUCE OPERATING COSTS

Using innovative tools, we develop state-of-the-art products designed for comprehensive training and exercise programs, complemented by ultra-realistic graphics and professional-grade equipment.

Our simulators are designed for the public works, transportation, road driving, agriculture, and forestry sectors.

Welcome to our world of simulation.

**DIDAC BDH NOW SUPPORTS
DRIVING SCHOOLS BY
DISTRIBUTING TENSTAR
DRIVING SIMULATORS IN
FRANCE.**

EXCELLENT MACHINE PERFORMANCE

Combining cutting-edge engineering with the latest technologies and programming methods, our simulators deliver an authentic machine-operating experience.

PROFESSIONAL EQUIPMENT

Our simulators are designed to meet the strictest quality and performance standards. Developed and assembled in Sweden, they incorporate components from leading manufacturers, such as seats and controls.

ULTRA-REALISTIC GRAPHICS

We design our graphical environment based on real machine models and driving environments to create a truly immersive experience.

**WE PREPARE STUDENTS FOR THE
REAL WORLD.**



www.tenstarsimulation.com

EFFECTIVENESS: SIMULATION ENHANCES LEARNING

Simulators allow learners to accumulate more hours of operating a machine or vehicle, regardless of the season or weather. They can even practice on their own, without the constant presence of an instructor.

SAFETY: SIMULATION REDUCES ACCIDENTS

Learners are trained in a safe and calm environment.

They can practice extreme situations and maneuvers without risk of injury or damage to the machine .

ENVIRONMENT: SIMULATION REDUCES EMISSIONS

The production and operation of a simulator generate a minimal carbon footprint compared to a traditional machine that runs on fossil fuels.

COST: SIMULATION IS COST-EFFECTIVE

A simulator is a profitable investment, with low operating costs and minimal downtime. Additionally, a single instructor can train multiple trainees simultaneously.

BUILD YOUR PLATFORM

WE HAVE A SOLUTION FOR EVERY NEED

Tenstar's proprietary hardware is built to order in Tanumshede, Sweden, and is available in three different standard designs. You can adapt the platform to create your optimal solution by choosing and combining professional components from the industry – steering wheel, joysticks, pedals, control systems, screens, VR headsets, etc.



DESKTOP SIMULATOR

The entry-level solution

- Tenstar Steering Wheel with professional pedals or gaming steering wheel with pedals.
- Automatic or manual gearbox
- Add joysticks to enable more machine types
- Touch screen and 1-3 landscape screens in the front



MOBILE UNIT - CAR

The complete solution for car simulation

- Tenstar Steering Wheel and professional hanging pedals
- Choose between an automatic or manual gearbox
- Car seat with three-point seat belt
- Touch screen and 3 asymmetrically positioned landscape screens in the front + 1 landscape screen to the rear



MOBILE UNIT - TRAFFIC

The ideal solution for most vehicles

- Professional low driver seat with seat belt
- Interchangeable truck or traffic pedals
- Add joysticks to enable more machine types
- Touch screen and 3 portrait screens in the front
- 1 optional landscape screen to the rear

A SELECTION OF OPTIONAL HARDWARE



TENSTAR STEERING WHEEL



VR HEADSET



GEAR SHIFTER



**MORE COMPETENT STUDENTS.
MORE PRACTICE HOURS FOR MORE QUALIFIED DRIVERS!**

TENSTAR MULTI-MACHINE DRIVING SIMULATOR

EFFECTIVE TRAINING BASED ON A METHODOLOGY.

CAREFULLY DESIGNED EXERCISES

Each type of machine is paired with a comprehensive set of rigorously developed exercises, optimized to train trainees in a variety of operations, from basic skills to complex maneuvers.

All training sessions are automatically recorded and stored in the system via TRR (Tenstar Record & Re-play). The exercises can be viewed at any time from any angle to help trainees refine their driving skills.

TRAINING ANALYSIS AND MONITORING

Tenstar is constantly refining its training methods. Working closely with experts from various fields, we continue to offer the best tools on the market.

The Tenstar scoring system calculates scores based on criteria of safety, quality, and cost-effectiveness. It allows you to evaluate, provide feedback on, and encourage the progress and professional development of learners.

FLEXIBILITY THROUGH UPDATES

We regularly improve and develop our simulators. With our remote technical support, you're guaranteed ongoing assistance.



MULTI-MACHINE ENVIRONMENT: INTERACTION AND COLLABORATIVE PRACTICE

With MME (Multi-Machine Environment), multiple trainees can cooperate and interact in a shared environment. By performing tasks in teams, learners gain a new advantage from simulator training, preparing them even better for real-world situations.



VIRTUAL REALITY INSPECTION: IMMERSION IN THE VIRTUAL ENVIRONMENT

VR-WA (Virtual Reality WalkAround) offers learners the opportunity to interact with machines and vehicles or to move around the surroundings. You can view all the details or perform pre-startup checks interactively. All you need is a virtual reality headset and two controllers.

☐ EQF 3

Vocational training

☒ EQF 4

Secondary vocational diploma

☒ EQF 5

Higher technical diploma

☒ EQF 6+

Higher education

AUTOMOTIVE

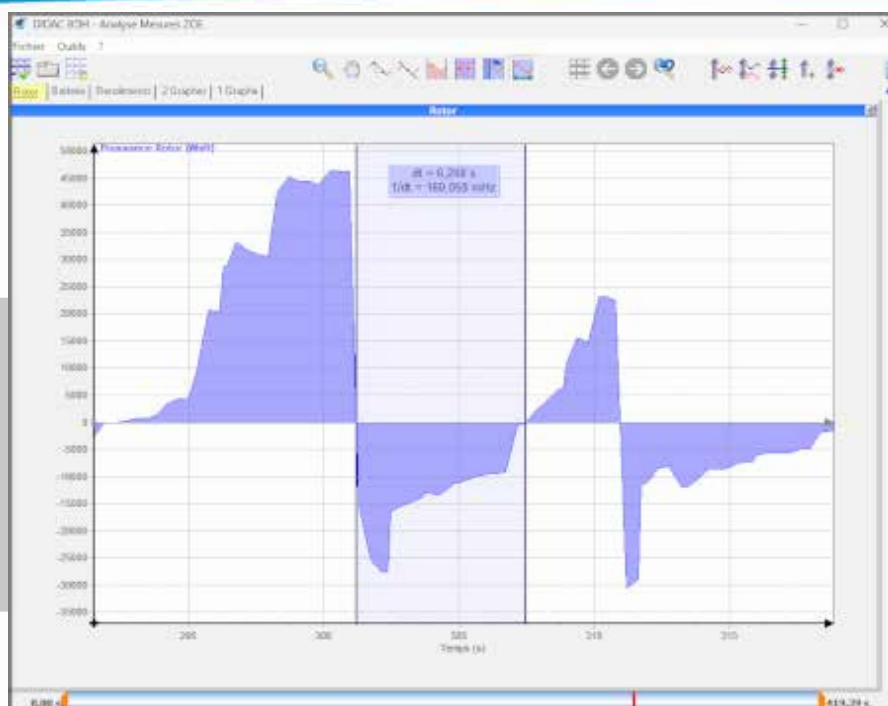
TRUCKS

AGRICULTURAL
MACHINERY

CONSTRUCTION

MATERIAL HANDLING
EQUIPMENT



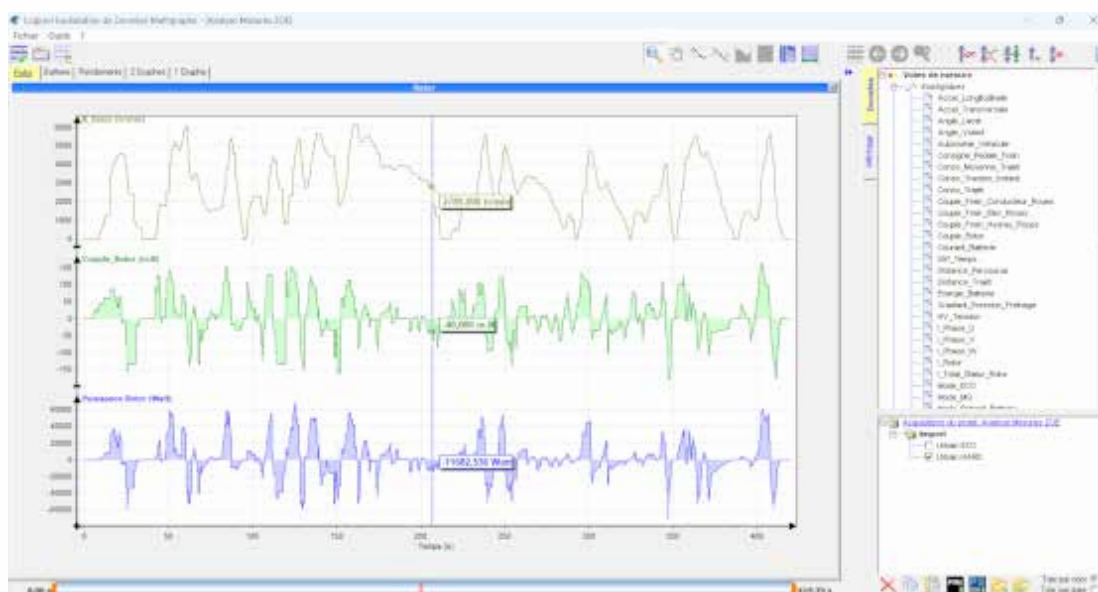


PRESENTATION

With our software, instructors and students—particularly those in the Vehicle Maintenance program—have a customized solution designed to meet their educational and technical needs.

Instructors can easily monitor and supervise students' technical projects thanks to clear visualization tools and centralized data management. For their part, students benefit from an intuitive interface that allows them to analyze their measurements accurately, thereby facilitating their understanding and application of the concepts studied.

An ideal tool for putting theory into practice and ensuring effective training!



ANALYZE YOUR MEASUREMENT DATA EASILY AND ACCURATELY.

MULTIGRAPH DATA EXPLOITATION SOFTWARE

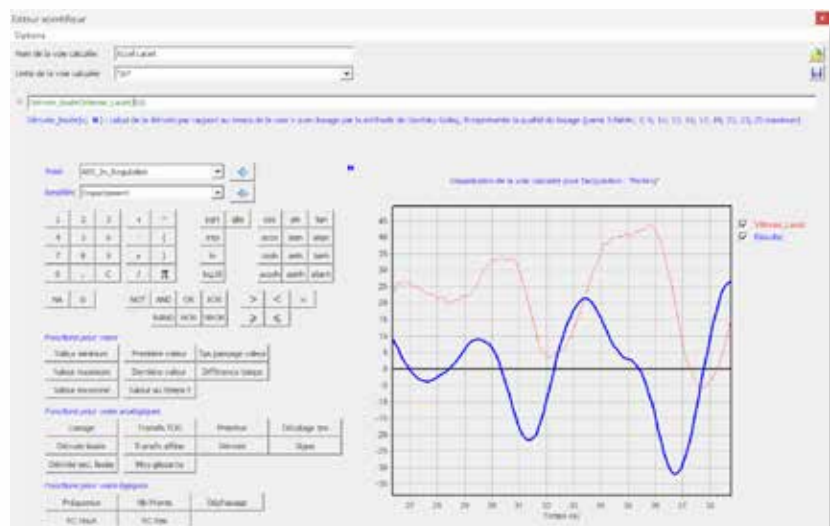
TRAINING ACTIVITIES

With our software:

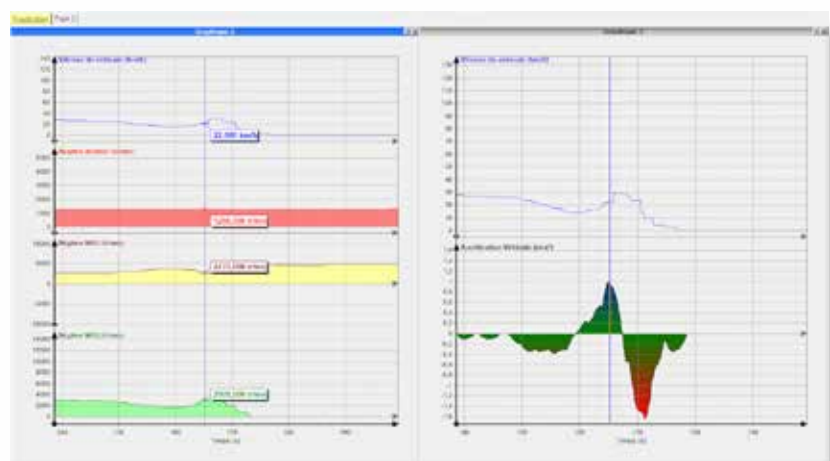
Centralize the management of your measurement data, whether it comes from our educational models, measurement tools, or diagnostic tools



Use, process, and analyze this data to facilitate the study of how vehicle systems and components function, as well as to simplify troubleshooting and diagnostics



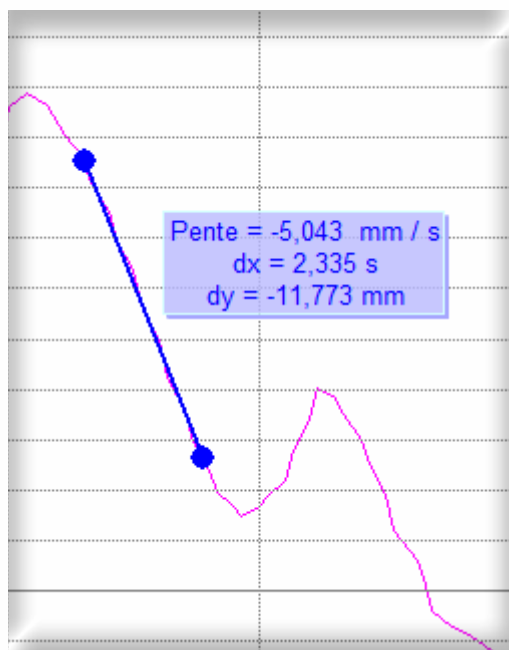
Finally, present your measurement results and calculations in a clear and relevant manner so that you can incorporate them into your lab reports, case studies, and technical projects.



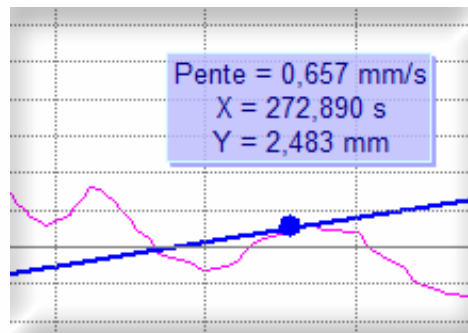
Several graphical tools are available to help you analyze and present your data:



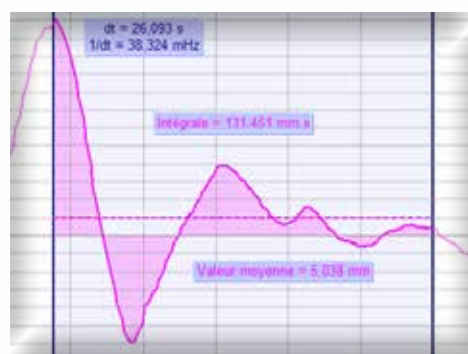
Calculating the slope between two points on a curve



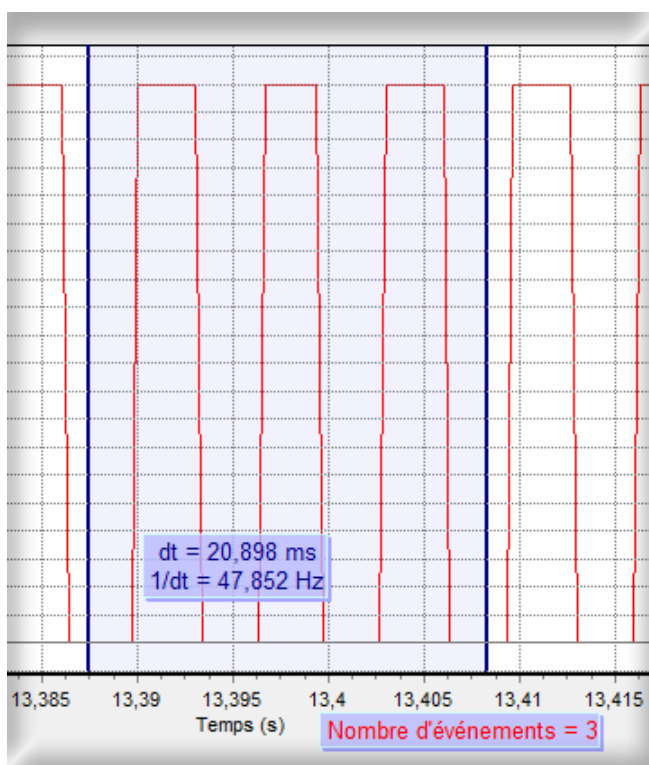
Calculating the tangent at a point on the curve



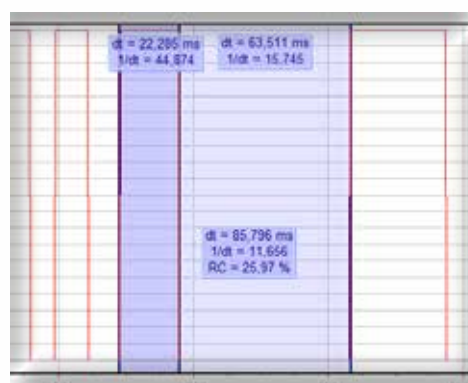
Calculation of a Bounded Integral with a Mean Value



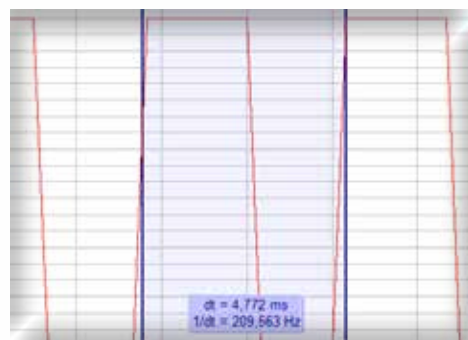
Digital Event Counter (Rising Edges)



Duty Cycle Measurement



Measurement of Duration and Frequency



MULTIGRAPH DATA EXPLOITATION SOFTWARE

SCIENTIFIC CALCULATOR



The scientific calculator allows you to create and save calculation formulas based on your data—for example, to convert raw sensor values into physical quantities by applying the laws governing the sensors.

Import d'une voie de calcul à partir d'un fichier

☒ Valeur_Physique_bar.calc	Nom	Valeur_Physique
☐ Valeur_Physique_mm.calc	Unité	mm
☐ Valeur_Physique_temp.calc	Commentaire	Loi de transformation du capteur de position
	Formule	Affine(Valeur_Capteur;15;2)

You can apply basic mathematical, logical, and scientific operators (powers, logarithms, trigonometry, etc.) as well as a selection of functions tailored to the signals encountered in the field of measurement and data acquisition analysis, including:

Fonctions pour voies

Valeur minimum	Première valeur	Tps passage valeur
Valeur maximum	Dernière valeur	Différence temps
Valeur moyenne	Valeur au temps t	

Fonctions pour voies analogiques

Lissage	Transfo TOR	Primitive	Décalage tps
Dérivée lissée	Transfo affine	Dérivée	Signe
Dérivée sec. lissée	Moy glissante		

Fonctions pour voies logiques

Fréquence	Nb Fronts	Déphasage
RC Haut	RC Bas	

A formula entry assistant helps you determine the best settings for the functions

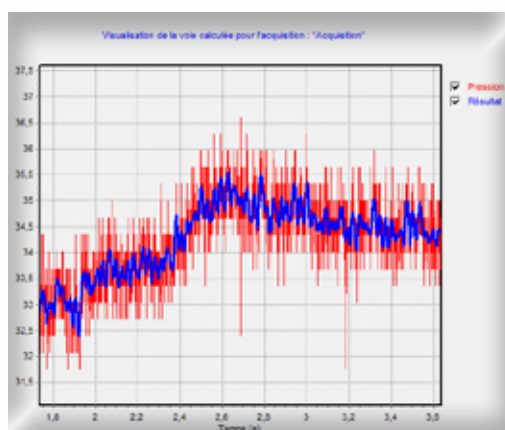
Nom de la voie calculée: Pression Lissée

Unité de la voie calculée: bar

= Lissage(Pression;25)

Lissage (v; N) : lissage de la voie v par la méthode de Savitsky-Golay, N représente la qualité du lissage (parmi 5:faible; 7; 9; 11; 13; 15; 17; 19; 21; 23; 25:maximum)

and a live preview of the results allows you to refine your calculations.



SIMPLIFIED ACCESS TO DATA

Allows students to view and manipulate data from our educational models, the CAR&BOX data acquisition system, the PDL diagnostic tool, and Excel files.

INTERPRETATION ASSISTANCE

Provides graphs, tools, and automated calculations to help you better understand vehicle performance and malfunctions.

WORKPLACE SIMULATION

Allows students to import data from diagnostic tools used in the workshop, thereby preparing them for the professional environment.

GRADUAL LEARNING

Helps students develop the skills needed to read and analyze measurements.

CHARACTERISTICS

System Requirements:



Windows 11



Windows 10

May also work on older systems; please contact us.

Interface language:



French



English

Can be changed from within the software

Sales Terms:



Per-Workstation Software License



Delivered on a USB drive or as a download from our website

☐ EQF 3

Vocational training

☒ EQF 4

Secondary vocational diploma

☒ EQF 5

Higher technical diploma

☒ EQF 6+

Higher education

AUTOMOTIVE

TRUCKS

AGRICULTURAL
MACHINERY

MATERIAL HANDLING
EQUIPMENT

CONSTRUCTION





PRESENTATION

This kit allows you to perform pneumatic diagnostics through quick and easy pressure measurements on our educational equipment, such as the Pneumatic Braking Model.

It is also compatible with and can be used on: road transport vehicles, agricultural vehicles, and construction machinery.

It consists of 4 pressure gauges ($\varnothing$ 63 - 016 Bars) and 4 hoses of different colors (L = 5 m), and is equipped with 4 Staubli pneumatic couplers and 4 quick-connect fittings that screw onto the pressure ports of pneumatic components (vehicles).

CHARACTERISTICS

Dimensions:

L = 116 D = 509 H = 360 mm

Weight:

3 kg

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Vocational training

☒ EQF 4

Secondary vocational diploma

☒ EQF 5

Higher technical diploma

☒ EQF 6+

Higher education

TRUCKS

AGRICULTURAL
MACHINERY

CONSTRUCTION





Luc MAURIN

BUSINESS AND SALES MANAGER

+33 6 77 82 98 91

luc.maurin@didacbdh.com



Mariannick MILLON

ADMINISTRATIVE ASSISTANT

+33 4 77 02 15 70

mariannick.millon@didacbdh.com



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